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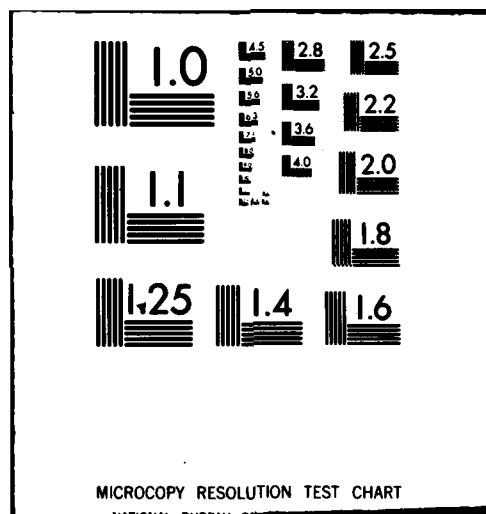
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PREFACE

This report has been prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

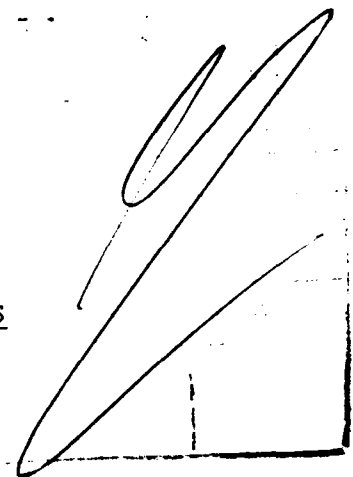
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The spillway design flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

1. PREPARED BY: L. D. DUGAN
2. REVIEWED BY: L. D. DUGAN AND WHITE

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

BRIEF ASSESSMENT OF GENERAL CONDITIONS
AND RECOMMENDATIONS



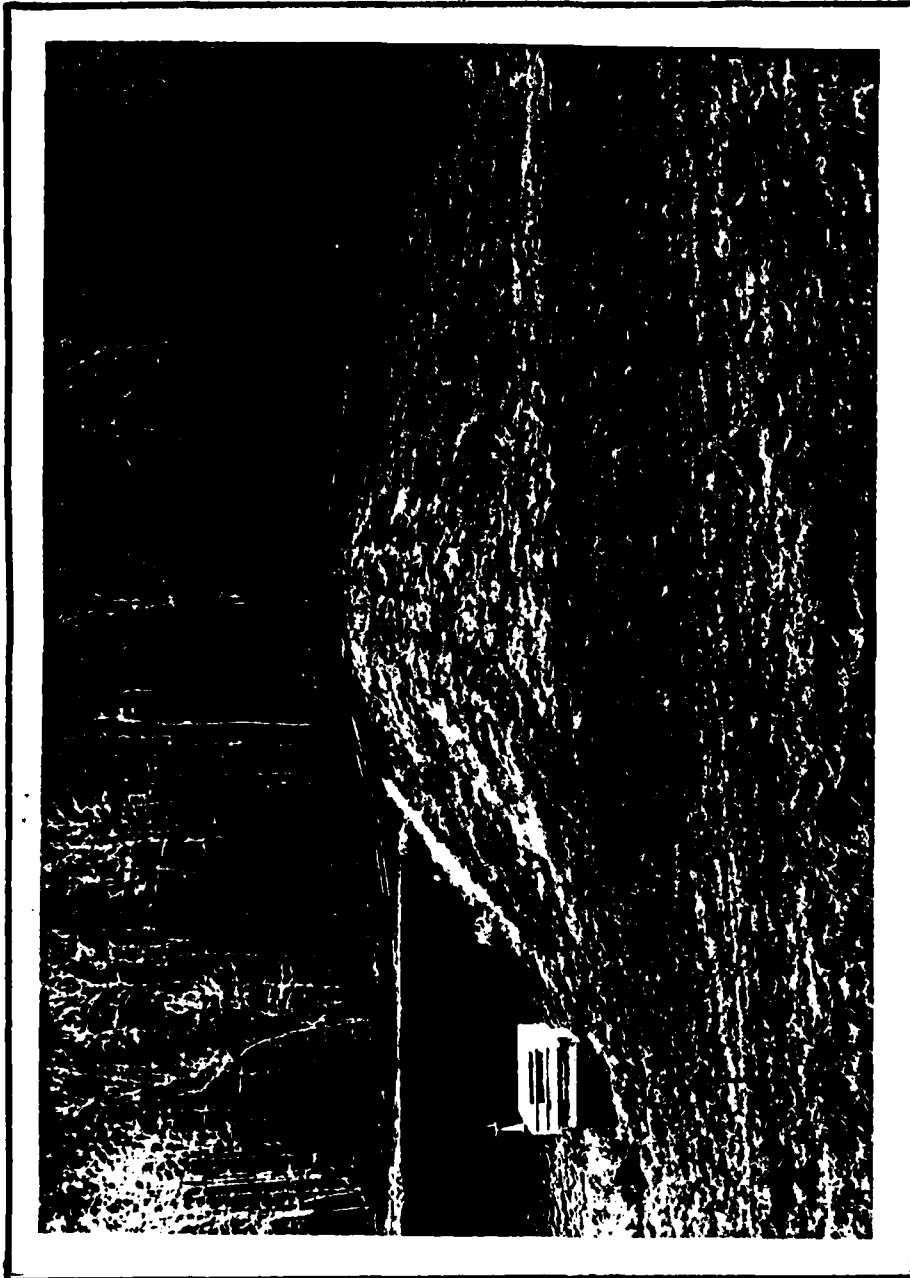
Name of Dam: SCS DAM PA-451
State & State No.: PENNSYLVANIA, 64-197
County: WAYNE
Stream: NEVIN CREEK
Date of Inspection: November 6, 1979

Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in good condition.

In accordance with the Corps of Engineers' evaluation guidelines, the size classification of this dam is small and the hazard classification is high. For this dam the recommended Spillway Design Flood (SDF) is the Probable Maximum Flood (PMF). The spillway capacity is able to pass the full PMF peak inflow without overtopping the dam, and is considered to be adequate.

The following recommendations are presented for immediate action by the owner:

1. That the fence in the emergency spillway be removed.
2. That a formal surveillance and downstream warning system be developed for use during periods of high or prolonged rainfall.



OVERVIEW

SCS DAM PA-451

Photograph No. 1

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

SCS DAM PA-451

NDI-ID NO. PA-01031

DER-ID NO. 64-197

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

A. Authority

The Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of inspections of dams throughout the United States.

B. Purpose

The purpose of this inspection is to determine if the dam constitutes a hazard to human life and property.

1.2 DESCRIPTION OF PROJECT

A. Description of Dam and Appurtenances

This flood control dam was designed by the United States Soil Conservation Service (SCS) and is known to its owners as SCS Dam PA-451. The facilities, completed in 1972, consist of a 300 foot long, zoned earthfill embankment with a maximum height of 15 feet above the streambed. The structure has two spillways. The principal spillway is a drop inlet structure and discharges through a 30-inch diameter pipe. An emergency spillway is constructed in the right abutment. This spillway consists of a grassed earth channel with a bottom channel width of 60 feet. The emergency spillway crest was designed to be 5 feet below the top of the dam.

B. Location:

Dreher Township, Wayne County
U.S.G.S. Quadrangle - Newfoundland, Pa.
Latitude 41°-17.7', Longitude 75°-21.7'
Appendix E, Plates I & II

C. Size Classification:

Small (Height 15 feet
Storage 190 acre-feet)

D. Hazard Classification: High (Refer to Section 3.1.E)

E. Ownership (Maintenance): Wayne County Commissioners
Wayne County Court House
Honesdale, PA 18431

F. Purpose: Flood control

G. Design and Construction History

The flood control dam was designed by the U.S.D.A. Soil Conservation Service. An application for a permit to construct the dam was filed by the Wayne County Commissioners and approved by the Pennsylvania Department of Environmental Resources (PennDER) on March 18, 1971. The contractor, Giffin Construction Company of Le Raysville, PA, started work on July 6, 1971. After a long winter shutdown, construction was completed in August 1972.

H. Normal Operating Procedures

The facilities were constructed to retard storm water runoff. Both spillways are uncontrolled. All inflow is discharged through the principal spillway until the pool level reaches the level of the emergency spillway crest.

1.3 PERTINENT DATA

A. Drainage Area (square miles)

From files:	0.5
Computes for this report:	0.5
Use:	0.5

B. Discharge at Dam Site (cubic feet per second)

See Appendix D for hydraulic calculations

Maximum estimated inflow, based on records of the U.S.G.S. gaging station on Mill Creek at nearby Mountainhome, Pa.	120
---	-----

Principal spillway at pool Elev. 1896.4 (Emergency spillway elevation)	68
--	----

Principal spillway at pool level Elev. 1901.1 (Low point of dam)	85
--	----

Emergency spillway capacity at pool Elev. 1901.1 (Low point of dam)	1966
---	------

Total spillway capacity	2051
C. <u>Elevation</u> (feet above mean sea level)	
Top of dam (low point as surveyed)	1901.1
Top of dam (design)	1901.8
Emergency spillway crest (as surveyed)	1896.4
Emergency spillway crest (design)	1896.8
Upstream orifice opening invert, normal pool (top of stoplog)	1890.7
Downstream outlet invert	1886.1
Streambed at centerline of dam - estimate	1888.0
D. <u>Reservoir</u> (miles)	
Length of normal pool	.3
Length of maximum pool	.4
E. <u>Storage</u> (acre-feet)	
Sediment pool spillway crest (Elev. 1890.7)	2.8
Emergency spillway crest (Elev. 1896.4)	98
Top of dam (Elev. 1901.1)	190
F. <u>Reservoir Surface</u> (acres)	
Top of dam (Elev. 1901.1)	21
Emergency spillway crest (Elev. 1896.4)	18
Sediment pool spillway crest (Elev. 1890.7)	15
G. <u>Dam</u>	
Refer to Plates III through IX in Appendix E for plan and section.	
Type: Zoned earthfill.	
Length: 300 feet.	

Height: 15 feet.

Top Width: Design - 12 feet; Surveyed - 13 feet.

Side Slopes:	<u>Design</u>	<u>Surveyed</u>
Upstream	3H to 1V	2.75H to 1V
Downstream	3H to 1V	2.75H to 1V

Zoning: Central core section of impervious material. Coarser material placed on the upstream and downstream sections.
(See Plate VI, Appendix E).

Cutoff: Cutoff trench excavated to varying depth across the valley (Plate IV, Appendix E).

Grouting: None.

H. Outlet Facilities

One 16 inch diameter orifice and sluice gate in principal spillway drop inlet structure, discharging through 30 inch diameter principal spillway conduit. Invert elevation is 1887.05.

I. Spillway

Sediment Pool

Type: 9 inch high by 24 inch wide orifice.

Location: Drop inlet structure.

Invert: 1890.2 (stoplog to 1890.7)

Principal

Type: Drop inlet structure. Riser has 2 side weirs, however, weirs become submerged with very little flow. Orifice of discharge conduit provides control.

Location: Upstream toe, center of dam.

Crest of Drop Inlet Structure: 1893.8

Invert of Orifice: 1886.8

Discharge Conduit: 30 inch diameter pipe through embankment.

Emergency

Type: Uncontrolled, sod-lined broad crested weir and channel.

Location: Right abutment.

Crest Elevation: 1896.4

Width: 60' on bottom with side slopes of 3H to 1V on both sides.

J. Regulating Outlet

See Section 1.3.H above.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

The engineering design data for this dam are found in two principal documents: A design report and the construction drawings. Both documents were prepared by the S.C.S., the design agency. The design report is a comprehensive documentary report with hydrologic and hydraulic data, soils investigation information, including field and laboratory results, geologic report, structural design calculations and specifications. This report and full size drawings are available in the PennDER files. Several of the drawings have been reduced and are included in Appendix E of this report. Reference is made to Section 5.1.A. and 6.1.B. of this report for discussion of some of the available design criteria.

2.2 CONSTRUCTION

The available construction data is limited to progress reports, indicating percentage of completion of major work items and a set of "As Built Plans." The plans shown in Appendix E are reproduced from this set. There are no records of any construction problems.

A copy of the project specifications as proposed in February 1971 is included in the design report.

2.3 OPERATION

There are no formal records of operation with the owner, PennDER or S.C.S. The purpose of the facility is flood control and besides an annual maintenance inspection program, there are no other operational procedures.

2.4 EVALUATION

A. Availability

Copies of the design report, as built drawings and specifications are available in the files of PennDER. Duplicate information is available in the files of the S.C.S. office in Harrisburg, PA.

B. Adequacy

The available engineering data is considered sufficiently adequate for a reasonable assessment of the design of the dam.

C. Operating Records

Operating records, including maximum pool levels, are not maintained by the County, the agency responsible for maintenance of the project.

D. Post Construction Changes

There have been no modifications made to this facility since the completion of construction in 1972, except that a barbed wire fence has been placed in the emergency spillway.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

A. General

The general appearance of SCS Dam PA-451 is good. The dam, completed in 1972, was designed by the Soil Conservation Service as a flood control structure and is located on privately owned property. The County Commissioners of Wayne County are responsible for the maintenance of the dam and its appurtenant structures. An access easement agreement exists between the owners of the property and the Commissioners. The contributing drainage area is small.

The visual inspection check list and sketches of the general plan and profile of the dam, as surveyed during the inspection, are presented in Appendix A of this report. Photographs made on the day of inspection are reproduced in Appendix C.

B. Embankment

The function of this dam is to detain storm water runoff and to release it slowly, thus, reducing the peak discharge in the downstream area. Storage, therefore, is its prime function. Most of its upstream slope is exposed at normal pool level.

The condition of the upstream and downstream embankment slopes appear to be good. There were no signs of slippage or sloughage. A heavy growth of field grass and crown vetch prevented close observation. Seepage was not observed; however, the normal pool level is close to the elevation of the downstream toe. Twelve-inch diameter CMP pipe drains are located in the downstream toe and are visible adjacent to the outlet pipe on each side.

The horizontal alignment of the dam is good. The vertical profile of the dam is apparently close to the design elevation. (Refer to Plate A-II, Appendix A). The crest of the embankment is covered with thick field grass.

C. Appurtenant Structures

There are two spillways; the principal spillway and an emergency spillway. The principal spillway consists of a drop inlet type structure with an orifice opening and an open top (See Photograph Plate C-II). The orifice was partially blocked by a piece of lumber (stoplog). Water discharges from this structure through a 30-inch pipe

under the embankment. At the outlet end of the pipe, there is an impact basin (Photograph No. 5). Twelve inch pipes discharge into the impact basin structure. These pipes are the outlet of an embankment drain.

The emergency spillway is located in the right abutment and consists of a grassed earth channel. Beyond the centerline of the dam, the channel curves to the left and joins the downstream channel of the principal spillway. A fence has been placed in the spillway, and could impede the flow.

D. Reservoir Area

This dam is located in the headwaters of the stream. The banks of the reservoir are stable. Most of the drainage area is wooded.

E. Downstream Channel

The immediate downstream area of the outlet pipe is natural woodlands. About 2,500 feet downstream from the dam are two homes. There is a potential for loss of life due to floodwaters downstream from the dam if the dam would fail. The hazard classification, therefore, is therefore considered to be "High."

3.2 EVALUATION

The overall visual evaluation of the facilities indicates that the dam is in good condition. The emergency spillway has a good grass mat for protection against erosion. The fence in the emergency spillway could impede the flow and should be removed. Although the small orifice opening (9 by 24 inches) has been blocked (to 3 by 24 inches), the drop inlet is an open type structure and considered to be adequate. The embankment has a thick growth of field grass and crown vetch, preventing close observation. There was no evidence of stability or seepage problems.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

This dam is a flood control dam maintained by Wayne County. All inflow is discharged through the uncontrolled principal spillway until the pool level reaches the elevation of the emergency spillway. The dam and facilities are regularly inspected by the County for possible maintenance requirements.

4.2 MAINTENANCE OF DAM

The embankment has a thick growth of field grass and crown vetch and apparently is not mowed. Brush or heavy weeds are not evident at the present time.

4.3 MAINTENANCE OF OPERATING FACILITIES

The only operating facility is a drawdown opening in the principal spillway. This opening is controlled by an 18-inch slide gate. Although the gate control was chained at the time of inspection, it was apparent that the mechanism is well maintained.

4.4 WARNING SYSTEM

There is no formally organized surveillance or downstream warning system in operation for this dam.

4.5 EVALUATION

Although the operational procedures for this dam are minimal, the facilities are in good condition. A formal surveillance plan and downstream warning system should be developed for implementation during periods of heavy or prolonged precipitation.

SECTION 5 - HYDROLOGY/HYDRAULICS

5.1 EVALUATION OF FEATURES

A. Design Data

The hydrologic and hydraulic analyses available from PennDER and SCS for SCS Dam PA-451 were extensive. A spillway rating curve, stage-storage curve, stage-area curve, design flood hydrograph and flood routing were all contained in the PennDER files. The computations contained in Appendix D of this report were made as a check on the designer's calculations. The designer's computations are in reasonably close agreement with those in the Appendix.

The design flood hydrograph used by the designer was based on SCS freeboard hydrograph having 24.5 inches of rainfall and producing a peak inflow of 2936 cfs. When routed through the reservoir, this flood caused the pond water level to rise to about 5 feet above the emergency spillway crest.

Since the design flood was not the Probable Maximum Flood (PMF), computations are shown in Appendix D to evaluate the routing of a PMF through this project.

B. Experience Data

There are no records of pool levels for SCS Dam PA-451. Based on discharge records of the U.S.G.S. stream gaging station for Mill Creek at nearby Mountainhome, Pa., the maximum discharge at the gage, since construction of the dam, occurred in June 1973. It is estimated that this storm produced a peak inflow to SCS Dam PA-451 of 120 cfs. This storm was passed without difficulty.

C. Visual Observations

On the date of the inspection, no conditions were observed that would indicate that the appurtenant structures of the dam could not operate satisfactorily during a flood event, until the dam is overtopped.

D. Overtopping Potential

SCS Dam PA-451 has a total storage capacity of 190 acre-feet and the overall height is 15 feet above the streambed. These dimensions indicate a size classification of "Small." The hazard classification for this dam is "High" (See Section 3.1.E).

The recommended Spillway Design Flood (SDF) for a dam having the above classification is in the range of one-half PMF to full PMF. Since this dam is a flood control structure, the recommended SDF is

equal to the full PMF. For this dam the PMF peak inflow is 1345 cfs (See Appendix D for hydraulic calculations).

Comparison of the estimated PMF peak inflow of 1345 cfs with the estimated total discharge capacity of 2051 cfs indicates that a potential for overtopping of the SCS Dam PA-451 by the PMF does not exist.

An estimate of the storage effect of the reservoir and routing of the computed inflow hydrograph through the reservoir shows that the spillway-reservoir system can pass a flood event equal to 100% of a PMF with about 1.3 feet of freeboard.

E. Spillway Adequacy

The small size and high hazard categories, in accordance with the Corps of Engineers criteria and guidelines, indicates that the Spillway Design Flood (SDF) for this dam is in the range of one-half the PMF to the full PMF. Since the dam is a flood control structure, the recommended SDF is the PMF.

Calculations show that the spillway discharge capacity and reservoir storage capacity combine to handle 100% of the PMF (Refer to Appendix D).

Since the spillway discharge and reservoir storage capacity can pass the full PMF without overtopping, the spillway is considered to be adequate.

The hydrologic analysis for this investigation was based upon existing conditions of the watershed. The effects of future development were not considered.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

A. Visual Observations

1. Embankment

The visual inspection of SCS Dam PA-451 did not detect any signs of embankment instability. The field survey indicates that the embankment slopes are approximately 2.75H to 1V, rather than the design slope of 3H to 1V. The existing slopes are considered to be adequate for the height of dam under consideration.

2. Appurtenant Structures

The emergency spillway in the right abutment appeared to be in good condition with a good grass mat for erosion protection. The side slopes are stable and the flow of water is directed away from the toe of dam with a spur dike constructed from soil (Appendix A, Plate A-I). The principal spillway was in good condition.

B. Design and Construction Data

The information contained in the design report and the "As Built Plans" indicate that this dam was designed using current and acceptable engineering procedures. Although stability calculations for the embankment were not located, the slopes of 2.75H to 1V are considered adequate for a 15 foot high flood control dam, constructed with zoned earthfill. A cutoff trench was excavated to suitable material (Plate IV, Appendix E) and a drain was constructed about 25 feet downstream of the centerline dam. This drain consists of a 12-inch perforated pipe in a filter and outlets in the impact basin. Three antiseep collars have been placed on the outlet pipe (Plate VIII, Appendix E).

C. Operating Records

Operating records for this dam have not been maintained.

D. Post Construction Changes

There have been no changes or modifications made to the dam since its completion in 1972.

E. Seismic Stability

This dam is located in Seismic Zone 1 and it is considered that the static stability is sufficient to withstand minor earthquake-induced dynamic forces. No studies or calculations have been made to confirm this assumption.

SECTION 7 - ASSESSMENT AND RECOMMENDATIONS

7.1 DAM ASSESSMENT

A. Safety

The visual inspection, the review of the design report, construction drawings and specifications indicate that SCS Dam PA-451 is in good condition and has been designed in accordance with current engineering practices. The field inspection did not detect any signs of instability or seepage that could be considered to endanger the safety of the dam.

The hydrologic and hydraulic computations indicate that the combination of storage capacity and the discharge of both spillways are adequate to handle 100 percent of the PMF. The spillway is considered to be adequate.

B. Adequacy of Information

The design information contained in the files are considered adequate for making a reasonable assessment of this dam. The conclusions reached, that this dam is adequately designed and constructed, is supported by the visual appearance of the entire facility.

C. Urgency

The recommendations presented below should be implemented as soon as possible.

D. Additional Studies

Additional studies are not required at this time.

7.2 RECOMMENDATIONS

In order to assure the continued satisfactory operation of this dam, the following recommendations are presented for implementation by the owner:

1. That the fence in the emergency spillway be removed.
2. That a formal surveillance and downstream warning system be developed for use during periods of high or prolonged rainfall.
3. That a program be developed for regular maintenance and inspection of the dam and its appurtenant structures.

APPENDIX A
CHECKLIST OF VISUAL INSPECTION REPORT

APPENDIX A

CHECK LIST

PHASE I - VISUAL INSPECTION REPORT

PA DER # 64-197

NDI NO. PA- 01031

NAME OF DAM SCS PA-451

HAZARD CATEGORY High

TYPE OF DAM Earthfill

LOCATION Dreher

TOWNSHIP Wayne

COUNTY, PENNSYLVANIA

INSPECTION DATE 11/6/79

WEATHER Cloudy, windy

TEMPERATURE Low 40's

INSPECTORS: R. Houseal(Recorder)

OWNER'S REPRESENTATIVE(s):

H. Jongsma

R. Shireman

A. Bartlett

NORMAL POOL ELEVATION: 1890.7 (stoplog) AT TIME OF INSPECTION:

BREAST ELEVATION: 1901.8 (design)

POOL ELEVATION: 1890.8±

SPILLWAY ELEVATION: 1896.8 (emergency)

TAILWATER ELEVATION: _____

MAXIMUM RECORDED POOL ELEVATION: _____

GENERAL COMMENTS: The general appearance of this dam is good.

VISUAL INSPECTION
EMBANKMENT

	OBSERVATIONS AND REMARKS
A. SURFACE CRACKS	None observed.
B. UNUSUAL MOVEMENT BEYOND TOE	None observed.
C. SLOUGHING OR EROSION OF EMBANKMENT OR ABUTMENT SLOPES	No evidence of distress on upstream or downstream slopes. The slopes are fairly flat and appear to be stable.
D. ALIGNMENT OF CREST: HORIZONTAL: VERTICAL:	Embankment crest has a straight horizontal alignment. See Surveyed profile for vertical alignment (Plate A-II).
E. RIPRAP FAILURES	No riprap on exposed upstream slope. Appears stone protection below flow line.
F. JUNCTION EMBANKMENT & ABUTMENT OR SPILLWAY	Left abutment is good. Right end of embankment curves and forms left side of emergency. (Plate A-I).
G. SEEPAGE	None detected.
H. DRAINS	Toe drains discharge into outlet structure through the concrete wing walls. 12-inch diameter pipes (C.C.M.).
J. GAGES & RECORDER	Staff gage painted on primary inlet structure.
K. COVER (GROWTH)	The crest and slopes have a heavy cover of field grass. The upstream and downstream slopes have a growth of crown vetch and weeds.

VISUAL INSPECTION
OUTLET WORKS
PRINCIPAL SPILLWAY

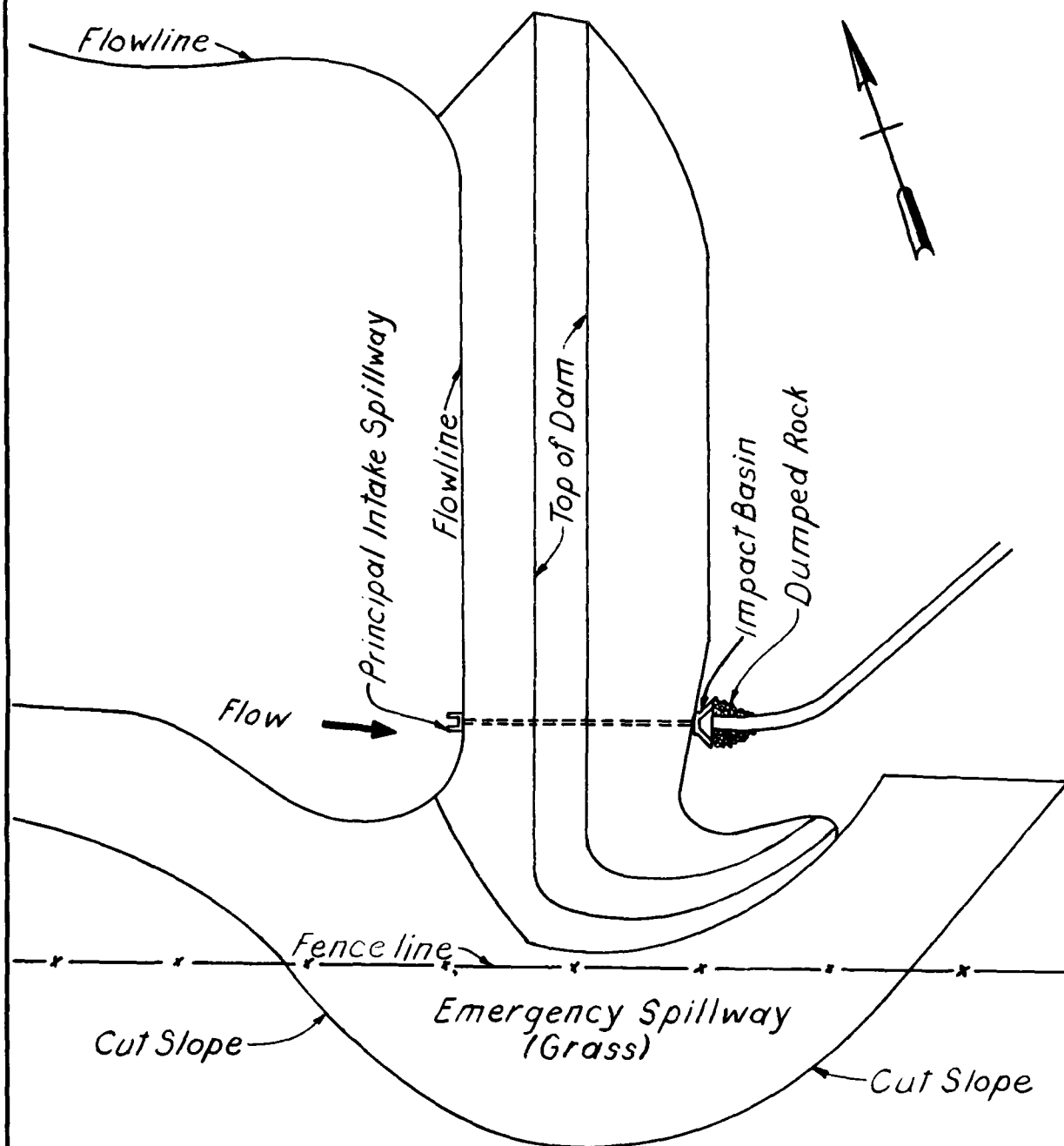
	OBSERVATIONS AND REMARKS
A. INTAKE STRUCTURE	The intake structure is the primary drop inlet type structure with a 30-inch concrete pipe outlet. The structure has an orifice opening and 2 ogee weirs on the side. The orifice closed down to a 3-inch opening with wooden log.
B. OUTLET STRUCTURE	Concrete structure with wing walls, concrete impact baffel, basin and sill overflow. 12-inch toe drain into outlet structure.
C. OUTLET CHANNEL	The outlet channel is formed by the left outside slope of the emergency spillway embankment and the immediate downstream area from the main embankment. The first 20'± d/s from the outlet structure is protected by dumped rock. The channel further d/s is a grassed swale for several hundred feet where it forms a natural stream channel.
D. GATES	The gate located in the intake structure. The gate control stand is exposed - mounted on the top of the inlet structure. This gate was chained and locked. It was not operated at this time. The control stand and the gate stem appeared to be in good condition.
E. EMERGENCY GATE	Same as above, not accessible during high pool levels.
F. OPERATION & CONTROL	No records.
G. BRIDGE (ACCESS)	None. Access during low pool levels from the upstream toe of embankment.

VISUAL INSPECTION
SPILLWAY

	OBSERVATIONS AND REMARKS
A. APPROACH CHANNEL	Emergency spillway is a grass covered earth facility at the right end of the main embankment.
B. WEIR: Crest Condition Cracks Deterioration Foundation Abutments	Grassed.
C. DISCHARGE CHANNEL: Lining Cracks Stilling Basin	The emergency spillway is grassed on the bottom and on both side slopes. A 4'± high fence crosses this spillway and could impede its effectiveness.
D. BRIDGE & PIERS	None.
E. GATES & OPERATION EQUIPMENT	None.
F. CONTROL & HISTORY	Unknown.

VISUAL INSPECTION

	OBSERVATIONS AND REMARKS
<u>INSTRUMENTATION</u>	
Monumentation	None.
Observation Wells	None.
Weirs	None.
Piezometers	None.
Staff Gauge	On principal inlet structure.
Other	None.
<u>RESERVOIR</u>	
Slopes	Wooded flat banks, stable.
Sedimentation	None reported.
Watershed Description	Wooded.
<u>DOWNSTREAM CHANNEL</u>	
Condition	Wooded natural stream.
Slopes	Slopes are relatively flat and stable.
Approximate Population	6.
No. Homes	At least two homes within 2,500 feet.



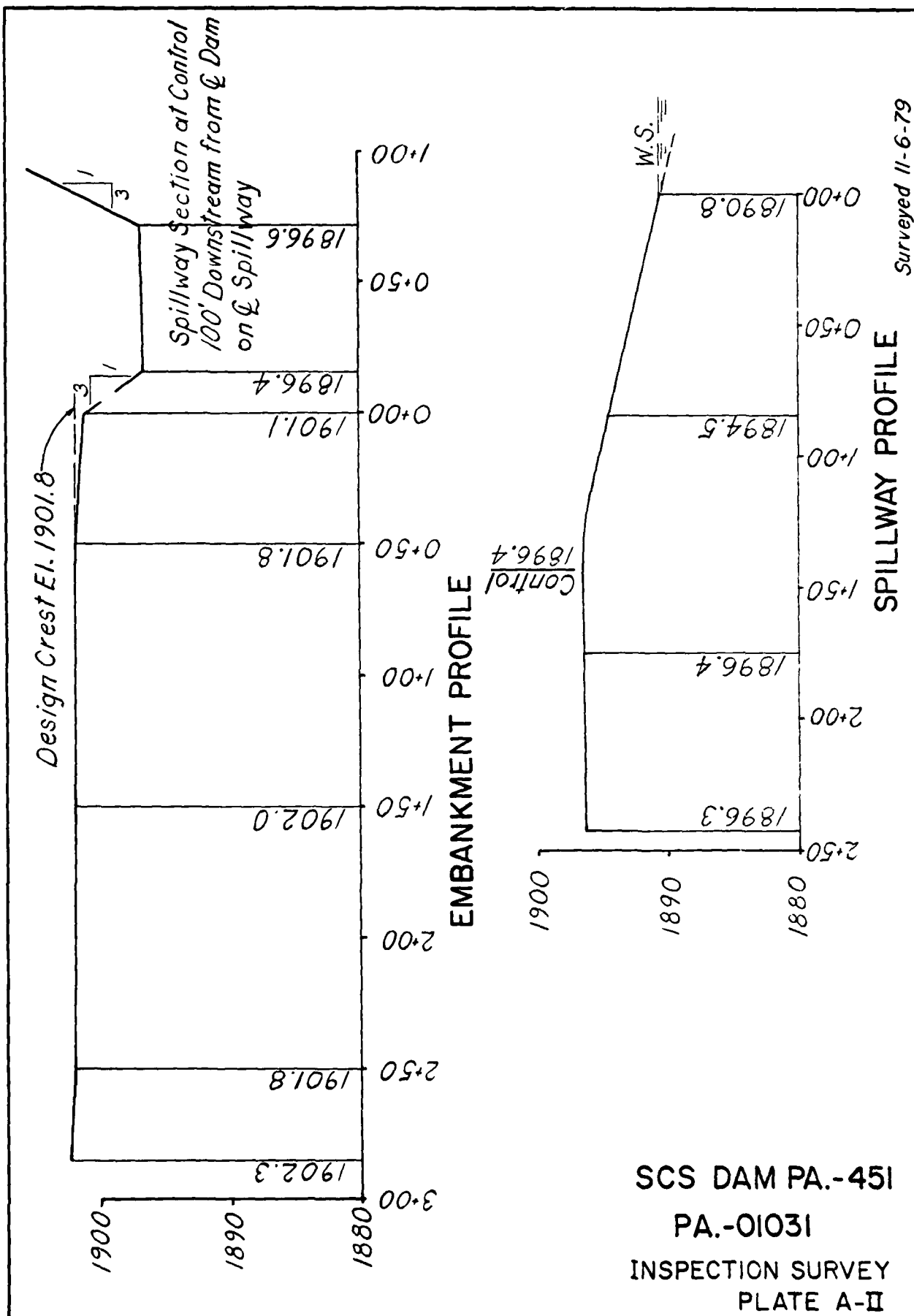
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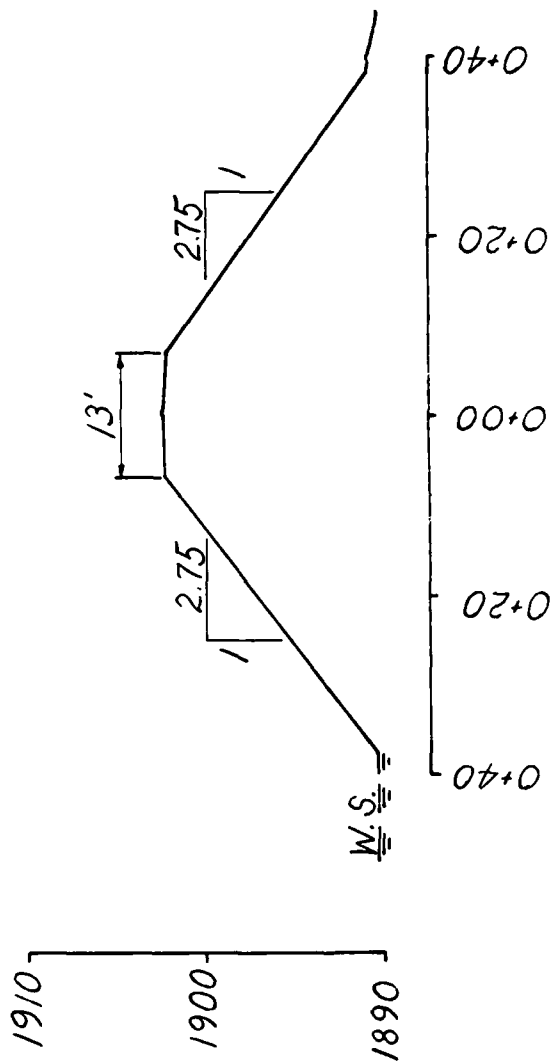
SCS DAM PA.-451

PA.-01031

INSPECTION SURVEY

PLATE A-I





EMBANKMENT SECTION

Surveyed 11-6-79

SCS DAM PA.-451

PA.-01031

INSPECTION SURVEY

PLATE A-III

APPENDIX B
CHECKLIST OF ENGINEERING DATA

APPENDIX B

CHECK LIST
ENGINEERING DATA

PA DER # 64-197

NDI NO. PA- 01031

NAME OF DAM SCS DAM PA-451

ITEM	REMARKS
AS-BUILT DRAWINGS	In PennDER files.
REGIONAL VICINITY MAP	U.S.G.S. Quadrangle Newfoundland, Pa. See Plate II, Appendix E
CONSTRUCTION HISTORY	Construction started July 1971, completed August 1972. Contractor: Giffin Construction Company, LeRaysville, Pa. No problems reported.
GENERAL PLAN OF DAM	Plate III, Appendix E.
TYPICAL SECTIONS OF DAM	Plate III, Appendix E.
OUTLETS: PLAN DETAILS CONSTRAINTS DISCHARGE RATINGS	Two outlets: principal spillway and emergency spillway. See Plates III through IX, Appendix E. In Design Report (PennDER files).

ENGINEERING DATA

ITEM	REMARKS
RAINFALL & RESERVOIR RECORDS	No records.
DESIGN REPORTS	S.C.S. Design Report. Copy in PennDER files.
GEOLOGY REPORTS	See Design Report.
DESIGN COMPUTATIONS: HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	See Design Report. No stability analysis in Design Report. No seepage studies. Permeability of borrow material.
MATERIALS INVESTIGATIONS: BORING RECORDS LABORATORY FIELD	See Design Report.
POST CONSTRUCTION SURVEYS OF DAM	None.
BORROW SOURCES	Excavation of emergency spillway was used in embankment.

ENGINEERING DATA

ITEM	REMARKS
MONITORING SYSTEMS	None.
MODIFICATIONS	None.
HIGH POOL RECORDS	No records.
POST CONSTRUCTION ENGINEERING STUDIES & REPORTS	None.
PRIOR ACCIDENTS OR FAILURE OF DAM Description: Reports:	None.
MAINTENANCE & OPERATION RECORDS	Annual inspection records.
SPILLWAY PLAN, SECTIONS AND DETAILS	Refer to Appendix E, Plates III through IX.

ENGINEERING DATA

ITEM	REMARKS
OPERATING EQUIPMENT, PLANS & DETAILS	Only operational equipment is gate on principal spillway to lower pond 3 feet below orifice opening.
CONSTRUCTION RECORDS	Percentage of completion. No records of construction problems.
PREVIOUS INSPECTION REPORTS & DEFICIENCIES	No reports.
MISCELLANEOUS	

NDI NO. PA- 01031

CHECK LIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 100% woodlands

ELEVATION:

TOP NORMAL POOL & STORAGE CAPACITY: Elev. 1890.2 Acre-Feet 3

TOP FLOOD CONTROL POOL & STORAGE CAPACITY: Elev. 1901.1 Acre-Feet 190

MAXIMUM DESIGN POOL: Elev. 1901.1

TOP DAM: Elev. 1901.1

SPILLWAY:	EMERGENCY	PRINCIPAL	SEDIMENT POOL
		Crest: 1893.8	
a. Elevation	<u>1896.8</u>	Invert: 1886.8	<u>1890.2</u>
b. Type	<u>Broad crested weir</u>	<u>30" dia. orifice</u>	<u>9" x 2' orifice</u>
c. Width	<u>60 feet</u>		
d. Length			
e. Location Spillover	<u>Right abutment</u>	<u>drop inlet structure</u>	<u>drop inlet structure</u>
f. Number and Type of Gates	<u>None</u>	<u>None</u>	<u>None</u>

OUTLET WORKS:

a. Type 16" dia. orifice with sluice gate

b. Location Drop inlet structure

c. Entrance inverts 1887.05

d. Exit inverts 1886.1

e. Emergency drawdown facilities Same

HYDROMETEOROLOGICAL GAGES:

a. Type None

b. Location

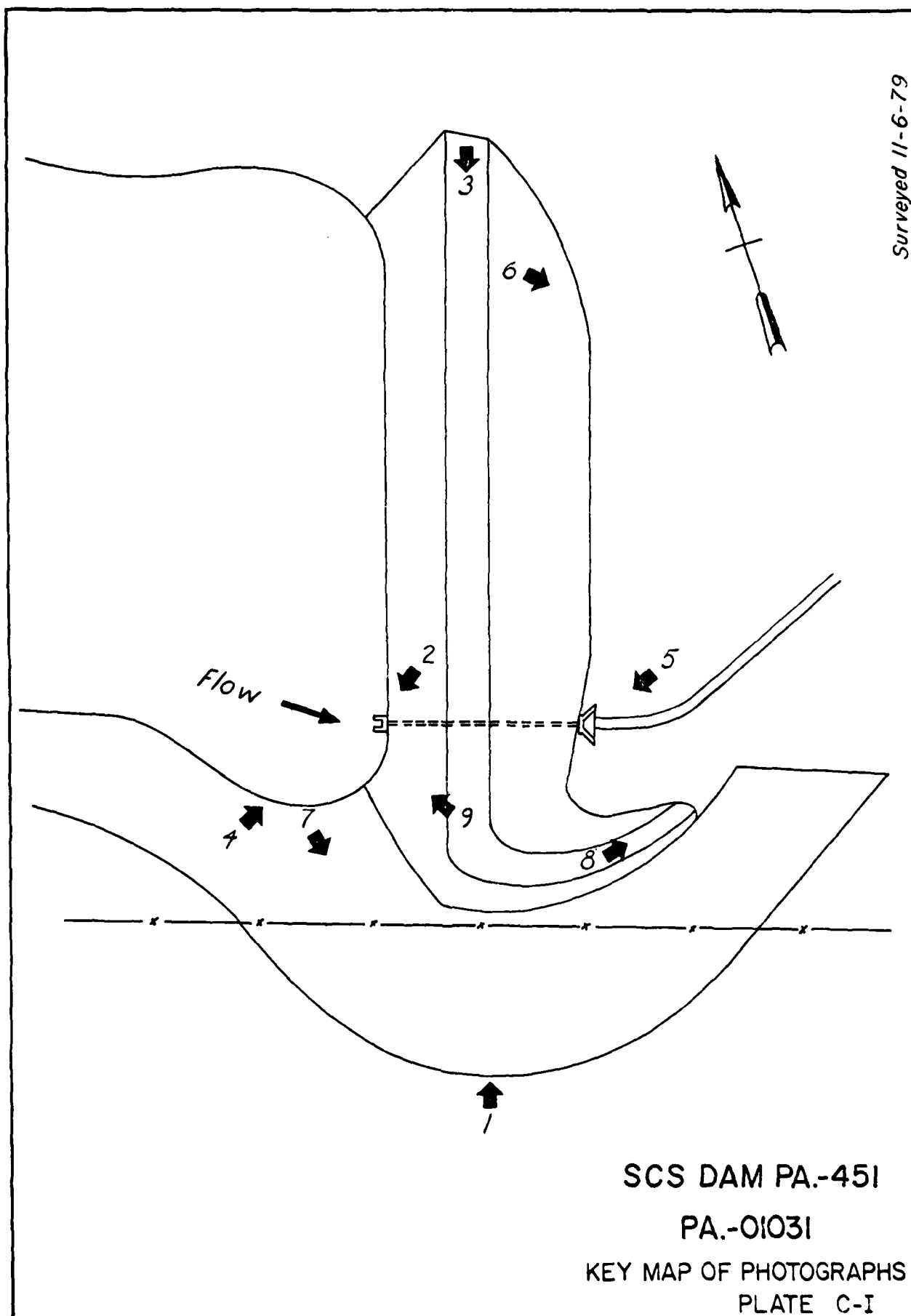
c. Records

MAXIMUM NON-DAMAGING DISCHARGE: 2051

APPENDIX C
PHOTOGRAPHS

APPENDIX C

Surveyed 11-6-79



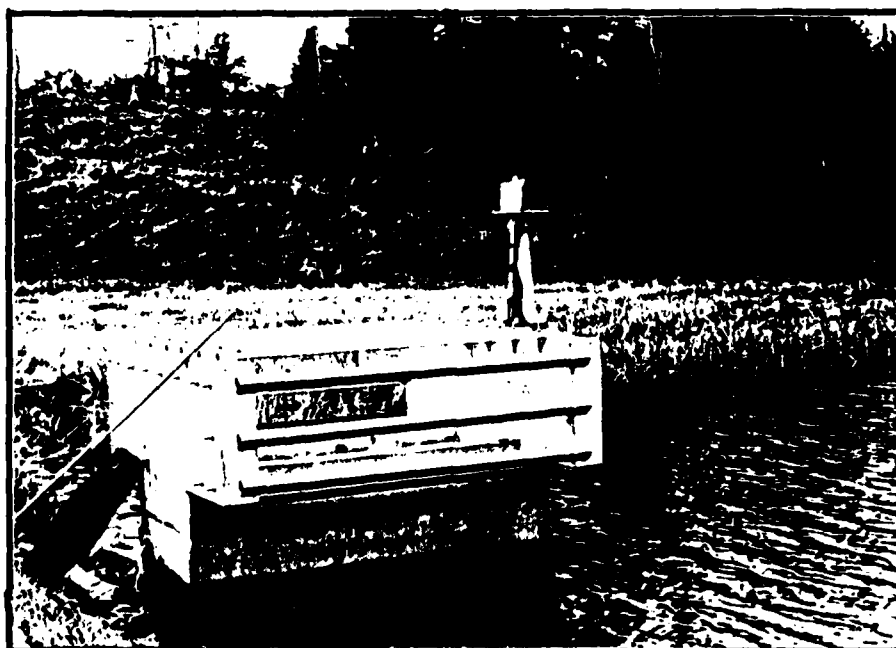
SCS DAM PA.-451

PA.-01031

KEY MAP OF PHOTOGRAPHS
PLATE C-I



RIGHT END OF EMBANKMENT WITH DROP INLET
STRUCTURE - NOTE EMERGENCY SPILLWAY IN BACKGROUND - NO. 2

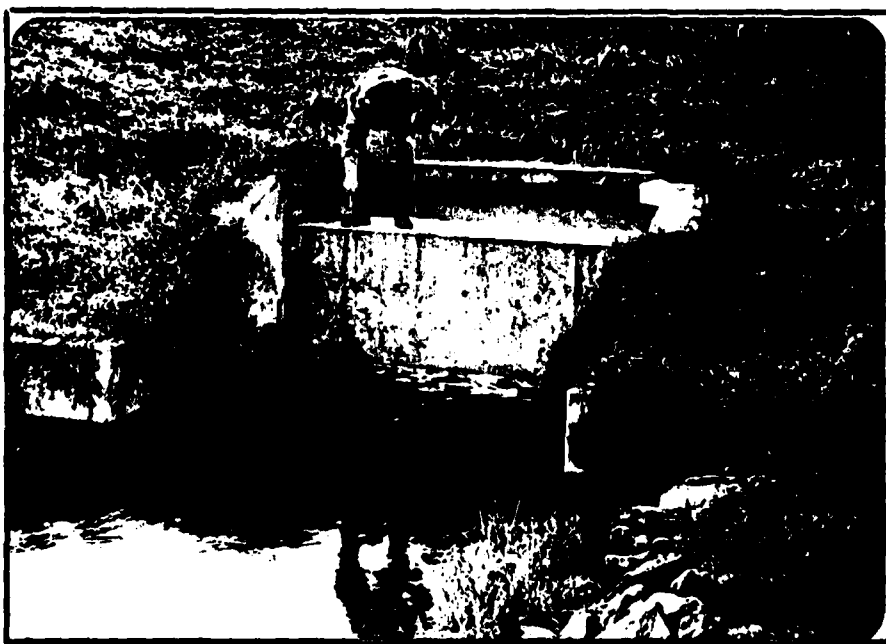


DETAIL DROP INLET STRUCTURE OR PRINCIPAL SPILLWAY - NO. 3

PA-01031
Plate C-II



UPSTREAM SLOPE & INLET STRUCTURE - NO. 4



ENERGY DISSIPATION STRUCTURE ON OUTLET PIPE - NO. 5

PA-01031
Plate C-III



DOWNSTREAM CHANNEL - NO. 6



EMERGENCY SPILLWAY LOOKING DOWNSTREAM
NOTE: FENCE ACROSS SPILLWAY - NO. 7

PA-01031
Plate C-IV



LOCATION WHERE EMERGENCY SPILLWAY JOINS NATURAL STREAM - NO. 8



RESERVOIR AREA - NO. 9

PA-01031
Plate C-V

APPENDIX D
HYDROLOGY AND HYDRAULIC CALCULATIONS

APPENDIX D

SUMMARY DESCRIPTION
OF
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION

The hydrologic and hydraulic evaluation for this inspection report has employed computer techniques using the Corps of Engineers computer program identified as the Flood Hydrograph Package (HEC-1) Dam Safety Version.

The program has been designed to enable the user to perform two basic types of hydrologic analyses: (1) the evaluation of the overtopping potential of the dam, and (2) the capability to estimate the downstream hydrologic-hydraulic consequences resulting from assumed structural failures of the dam. A brief summary of the computation procedures typically used in the dam overtopping analysis is shown below.

- Development of an inflow hydrograph to the reservoir.
- Routing of the inflow hydrograph(s) through the reservoir to determine if the event(s) analyzed would overtop the dam.
- Routing of the outflow hydrograph(s) of the reservoir to desired downstream locations. The results provide the peak discharge and maximum stage of each routed hydrograph at the outlet of the reach.

The output data provided by this program permits the comparison of downstream conditions just prior to a breach failure with that after a breach failure and the determination as to whether or not there is a significant increase in the hazard to loss of life as a result of such a failure.

The results of the studies conducted for this report are presented in Section 5.

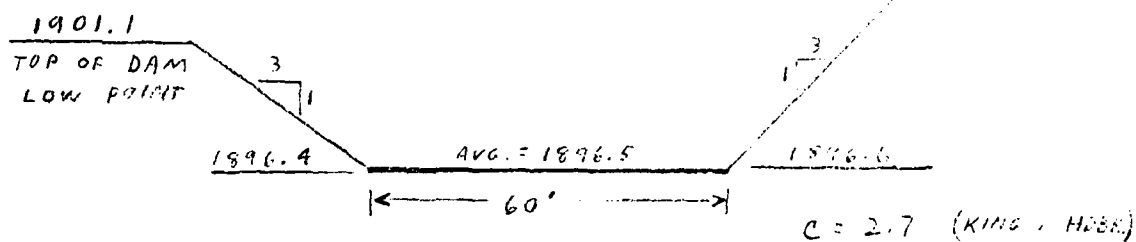
For detailed information regarding this program refer to the Users Manual for the Flood Hydrograph Package (HEC-1) Dam Safety Version prepared by the Hydrologic Engineering Center, U.S. Army Corps of Engineers, Davis, California.

BY RLS DATE 2/8/80
CHKD. BY _____ DATE _____
SUBJECT _____

BERGER ASSOCIATES

SHEET NO. 1 OF 1
PROJECT D.9.650

EMERGENCY STILLWAY RATING



$$L = (60 + 60 + 2(3H)) / 2$$

$$Q = CLH^{3/2}$$

$$H = 1901.1 - 1896.5 = 4.6'$$

$$L = (60 + 60 + 2(3 \times 4.6)) / 2 = 73.8'$$

$$Q = 2.7 \times 73.8 \times (4.6)^{1.5}$$

$$= 1766 \text{ CFS}$$

BY RLS DATE 2/11/88
CHKD. BY _____ DATE _____
SUBJECT _____

BERGER ASSOCIATES

SHEET NO. 2 OF
PROJECT D 9652

PRINCIPAL STILLWATER RATING

ORIFICE 30" DIA. C = 0.6

INVERT = 1886.8

$$Q = CA \sqrt{2gH}$$

AT POOL ELEV. 1896.4

$$H = 1896.4 - 1888.05 = 8.35$$

$$Q = 0.6 \times \pi \times \frac{(2.5)^2}{4} \times (2 \times 32.2 \times 8.35)^{0.5}$$
$$= 68 \text{ CFS}$$

AT POOL ELEV. 1901.1

$$H = 1901.1 - 1888.05 = 13.05$$

$$Q = 0.6 \times \pi \times \frac{(2.5)^2}{4} \times (2 \times 32.2 \times 13.05)^{0.5}$$
$$= 85 \text{ CFS}$$

SEDIMENT POOL SPILLWAY

ORIFICE 3" HIGH X 2' WIDE ,

INVERT = 1890.7

$$Q = CA \sqrt{2gH}$$

AT POOL ELEV. 1893.8

$$H = 1893.8 - 1890.83 = 2.97$$

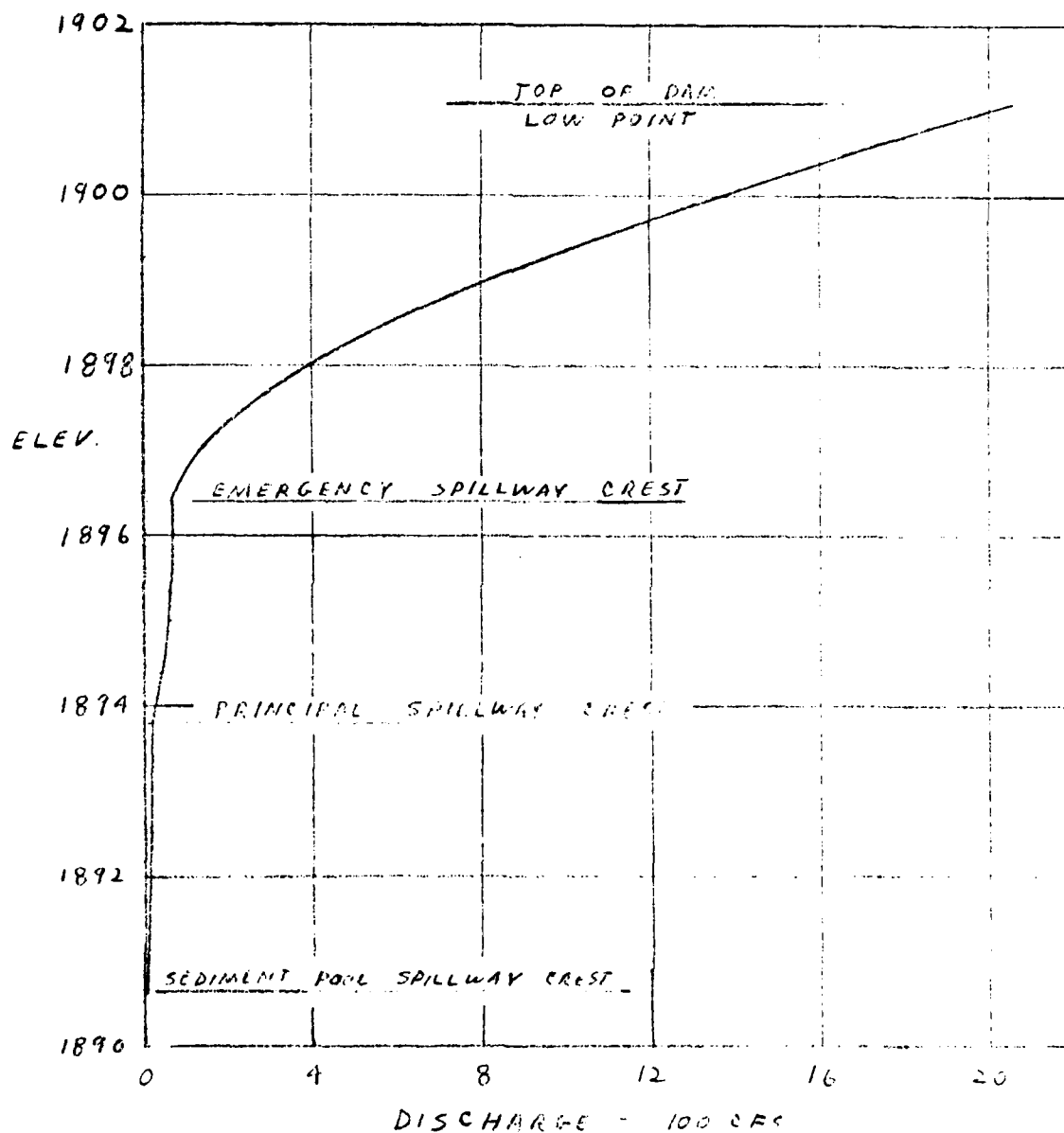
$$Q = 0.6 \times .25 \times 2 \times (2 \times 32.2 \times 2.97)^{0.5}$$
$$= 1 \text{ CFS}$$

BY RLS DATE 2/11/82
CHKD. BY _____ DATE _____
SUBJECT _____

BERGER ASSOCIATES

SHEET NO. 3 OF 3
PROJECT 09000

DISCHARGE RATING CURVE



BY RLS DATE 2/12/80
CHKD. BY _____ DATE _____
SUBJECT _____

BERGER ASSOCIATES

SHEET NO. 4 OF
PROJECT LA 650

DISCHARGE THRU POND DRAIN

ORIFICE 16" DIA

C = 0.6

INVERT = 1887.05

$$Q = CA \sqrt{2gH}$$

AT POOL ELEV. 1890.7

$$H = 1890.7 - 1887.72 = 2.98$$

$$Q = 0.6 \times \pi \times \frac{(1.33)^2}{4} \times (2 \times 32.2 \times 2.98)^{0.5}$$
$$= 11.5 \text{ CFS}$$

AT LOW POOL ELEV. 1888.5

$$H = 1888.5 - 1887.72 = .78$$

$$Q = 0.6 \times \pi \times \frac{(1.33)^2}{4} \times (2 \times 32.2 \times .78)^{0.5}$$
$$= 5.9 \text{ CFS}$$

BY RLS DATE 2/11/80
CHKD. BY DATE
SUBJECT

BERGER ASSOCIATES

SHEET NO. 5 OF
PROJECT D9656

PA: 451

MAXIMUM KNOWN FLOOD AT DAMSITE

THERE ARE NO RECORDS OF POOL LEVELS FOR THIS DAM. BASED ON THE RECORDS OF THE GAGE STATION FOR MILL CREEK AT NEARBY MOUNTAIN HOME, PA. (D.A. = 5.84 SQ. MI.) THE MAXIMUM DISCHARGE AT THE GAGE OCCURRED IN JUNE 1973 WHEN A DISCHARGE OF 855 CFS WAS OBSERVED. THE MAXIMUM INFLOW TO SCS DAM PA-451 IS ESTIMATED TO BE:

$$Q = \left(\frac{.5}{5.84} \right)^{0.8} \times 855$$
$$= 120 \text{ CFS}$$

DESIGN FLOOD

SIZE CLASSIFICATION

MAXIMUM STORAGE = 190 ACRE-Feet

MAXIMUM HEIGHT = 15 FEET

SIZE CLASSIFICATION IS "SMALL"

HAZARD CLASSIFICATION

SEVERAL HOUSES ARE LOCATED ALONG THE
DOWNSTREAM CHANNEL.

USE "HIGH"

RECOMMENDED SPILLWAY DESIGN FLOOD

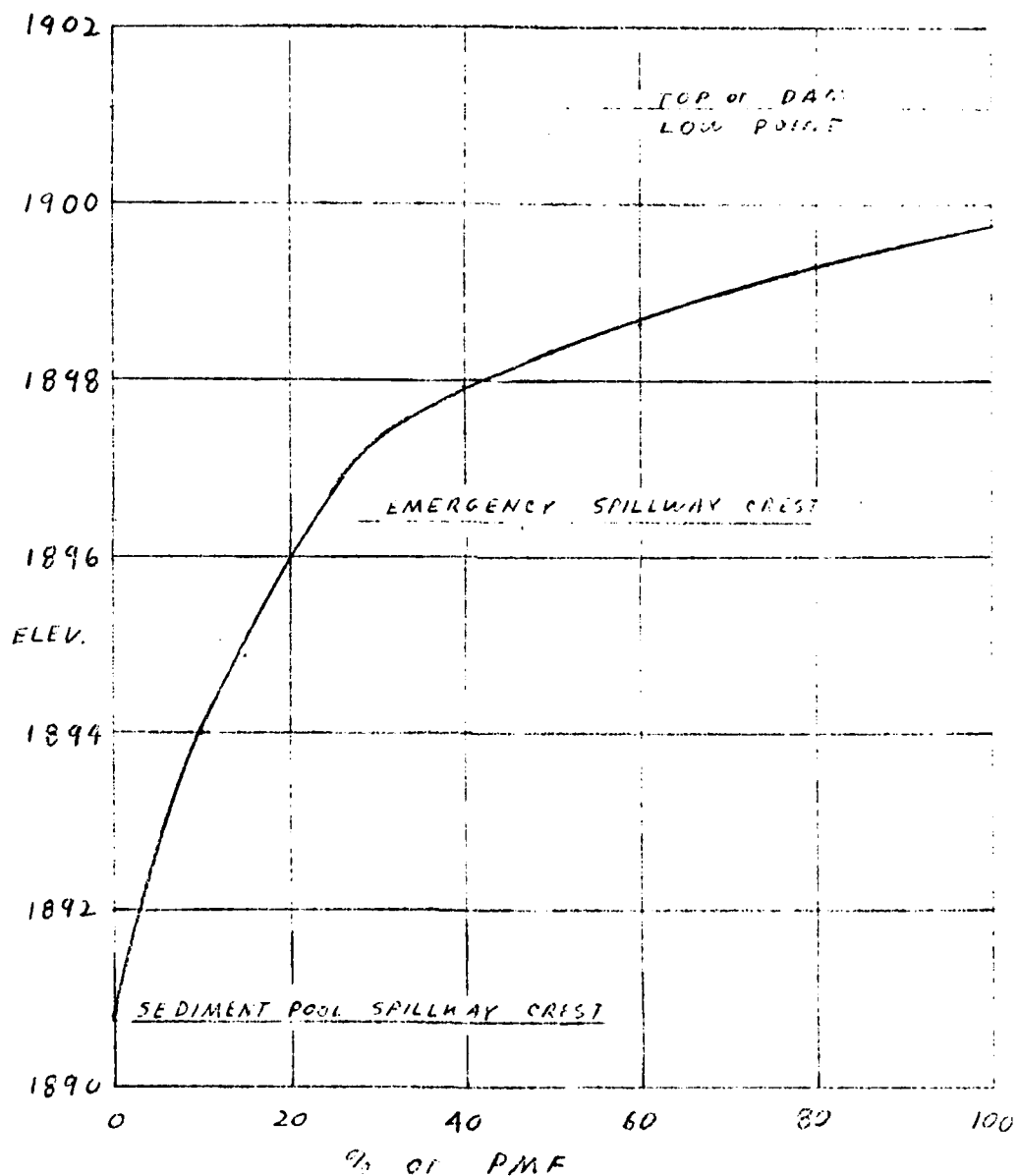
THE ABOVE CLASSIFICATIONS INDICATE
USE OF AN SDF EQUAL TO ONE-HALF
PMF TO THE PROBABLE MAXIMUM FLOOD.

BY RLS DATE 2/11/80
CHKD. BY _____ DATE _____
SUBJECT _____

BERGER ASSOCIATES

SHEET NO. 6 OF
PROJECT D765C

SPILLWAY CAPACITY CURVE



HYDROLOGY AND HYDRAULIC ANALYSIS DATA BASE

NAME OF DAM: SCS DAM PA-451 RIVER BASIN: DELAWARE
PROBABLE MAXIMUM PRECIPITATION (PMP) = 21.9 INCHES/24 HOURS⁽¹⁾

(FOR FOOTNOTES SEE NEXT PAGE)

STATION		1	2	3	4
STATION DESCRIPTION		LAKE	DAM		
DRAINAGE AREA (SQUARE MILES)		.5			
CUMULATIVE DRAINAGE AREA (SQUARE MILE)		.5	.5		
ADJUSTMENT OF PMP FOR DRAINAGE AREA (%) (2)	6 HOURS	111			
	12 HOURS	123			
	24 HOURS	133			
	48 HOURS	142			
	72 HOURS	-			
		Zone 1			
SNYDER HYDROGRAPH PARAMETERS	ZONE ⁽³⁾	1			
	C_p / C_t ⁽⁴⁾	.45/1.23			
	L (MILES) ⁽⁵⁾	1.1			
	L_{co} (MILES) ⁽⁵⁾	.67			
	$T_p = C_t (L \cdot L_{co})^{0.3}$ (hours)	1.12			
SPILLWAY DATA	CREST LENGTH (FT.)		SEDIMENT POOL 9" x 2'	PRINCIPAL 30" dia.	EMERGENCY 60'
	FREEBOARD (FT.)		10.9	7.3	4.7
	DISCHARGE COEFFICIENT		0.6	0.6	2.7
	EXPONENT				1.5
	ELEVATION		1890.2	Crest: 1893.8 Invert: 1886.8	1896.4
AREA (6) (ACRES)	NORMAL POOL (1890.7)		15.1		
	ELEV. <u>1895</u>		17.5		
	ELEV. <u>1905</u>		23.3		
STORAGE (ACRE-Feet)	NORMAL POOL ⁽⁷⁾ (1890.7)		2.8		
	ELEV. <u>1889.6</u> (8)		0		
	ELEV. _____ (8)				
	ELEV. _____ (8)				

- (1) Hydrometeorological Report 33 (Figure 1), U.S. Army, Corps of Engineers, 1956.
- (2) Hydrometeorological Report 33 (Figure 2), U.S. Army, Corps of Engineers, 1956.
- (3) Hydrological zone defined by Corps of Engineers, Baltimore District, for determining Snyder's Coefficients (C_p and C_t).
- (4) Snyder's Coefficients.
- (5) L = Length of longest water course from outlet to basin divide.
 L_{ca} = Length of water course from outlet to point opposite the centroid of drainage area.
- (6) Planimetered area encompassed by contour upstream of dam.
- (7) PennDER files.
- (8) Computed by conic method.

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

1/4

1	A1	SCS DAM PA-451	****	NEVIN CREEK						
2	A2	DREHER TWP., WAYNE COUNTY, PA.								
3	A3	NDI # PA-01031	PA DER # 64-197							
4	B	300	0	15	0	0	0	0	0	-4
5	B1	5								
6	J	1	9	1						
7	J1	1	.8	.6	.5	.4	.3	.2	.15	.1
8	K		1					1		
9	K1		INFLOW HYDROGRAPH							
10	M	1	1	.5						
11	P		21.9	111	123	133	142			
12	T							1	.05	
13	W	1.12	.45							
14	X	-1.5	.05	2						
15	K	1	2					1		
16	K1		RESERVOIR ROUTING							
17	Y		1							
18	Y1	1					2.8	-1		
19	Y41890.7	1693.8	1895	1896.4	1897	1898	1899.3	1901.1		
20	Y5	0	4	62	68	129	395	944	2051	
21	\$4	0	15.1	17.5	18.8	20.2	23.3			
22	\$E1890.1	1890.7	1895	1897.2	1900	1905				
23	\$41896.4									
24	\$D1901.1									
25	K	99								

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT 1
ROUTE HYDROGRAPH TO 2
END OF NETWORK

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

RUN DATE: 80/03/05.
TIME: 07.52.18.

SCS DAM PA-451 **** NEVIN CREEK
DREHER TWP., WAYNE COUNTY, PA.
NDI # PA-01031 PA DER # 64-197

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METAC	IPLT	IPAT	NOTA
300	0	15	0	0	0	0	0	-4	0
			JOPER	NWT	LCOPT	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED

NPLAN= 1 NRTIO= 9 LRTIO= 1
RTIOS= 1.00 .80 .60 .50 .40 .30 .20 .15 .10

SCS DAM PA-451 *** NEVIN CUREN
DREHER TWP., WAYNE COUNTY, PA.
NDI # PA-01031 PA DER # 64-197

2/6

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	Imin	METRC	IPLT	IPRT	NSTAN
300	0	15	0	0	0	0	0	-4	0
			JOPER	NUT	LROPT	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED

NPLAN= 1 NRTIO= 9 LRTIO= 1
RTIOS= 1.00 .90 .60 .50 .40 .30 .20 .15 .10

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH

ISTAQ	IDCMP	IECON	ITAPE	JPLT	JPRT	INAKE	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUGS	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.50	0.00	.50	0.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.90	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LOSS DATA

LROPT	STRNR	DLTR	RTIOI	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSNX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.05	0.00	0.00

UNIT HYDROGRAPH DATA

TP= 1.12 CP= .45 NTA= 0

RECESSION DATA

STRTQ= -1.50 QRCN= .05 RTICR= 2.00

UNIT HYDROGRAPH 41 END-OF-PERIOD ORDINATES, LAG= 1.13 HOURS, CP= .45 VOL= 1.00

12.	43.	83.	116.	127.	118.	103.	89.	78.	68.
59.	51.	45.	39.	34.	29.	26.	22.	19.	17.
15.	13.	11.	10.	8.	7.	6.	5.	5.	4.
4.	3.	3.	2.	2.	2.	2.	1.	1.	1.
1.									

0

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

SUM 24.88 22.49 2.39 20190.
(632.77 571.77 51.77 817.39)

3/1

HYDROGRAPH ROUTING

RESERVOIR ROUTING

ISTAD	ICOMP	TECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	EAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTD	LAG	ANSKK	X	TEK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	3.	-1

STAGE	1890.70	1893.80	1895.00	1896.40	1897.00	1898.00	1899.30	1901.10
FLOW	0.00	4.00	62.00	68.00	129.00	395.00	944.00	2051.00
SURFACE AREA=	0.	15.	18.	19.	20.	23.		
CAPACITY=	0.	3.	73.	113.	168.	276.		
ELEVATION=	1890.	1891.	1895.	1897.	1900.	1905.		

OREL	SPWID	COOW	EXPW	ELEV	COOL	CAREA	EXPL
1896.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COORD	EXPD	DAMWID
1901.1	0.0	0.0	0.

PEAK OUTFLOW IS 1252. AT TIME 41.25 HOURS

PEAK OUTFLOW IS 968. AT TIME 41.50 HOURS

PEAK OUTFLOW IS 690. AT TIME 41.75 HOURS

PEAK OUTFLOW IS 542. AT TIME 42.00 HOURS

PEAK OUTFLOW IS 378. AT TIME 42.50 HOURS

PEAK OUTFLOW IS 218. AT TIME 43.25 HOURS

PEAK OUTFLOW IS 66. AT TIME 44.75 HOURS

PEAK OUTFLOW IS 56. AT TIME 44.50 HOURS

PEAK OUTFLOW IS 14. AT TIME 45.75 HOURS

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS								
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9
				1.00	.80	.60	.50	.40	.30	.20	.15	.10
HYDROGRAPH AT	1	.50	1	1345.	1076.	807.	672.	535.	403.	269.	242.	184.
	(1.29)	(	(	38.08)(	30.47)(	22.85)(	19.04)(	15.23)(	11.42)(	7.62)(	5.71)(	3.81)(
ROUTED TO	2	.50	1	1252.	968.	690.	542.	378.	216.	88.	56.	14.
	(1.29)	(	(	35.45)(	27.42)(	19.55)(	15.34)(	10.69)(	5.16)(	1.87)(	1.80)(	.39)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1890.66	1896.40	1901.10
STORAGE	2.	96.	190.
OUTFLOW	0.	68.	2091.

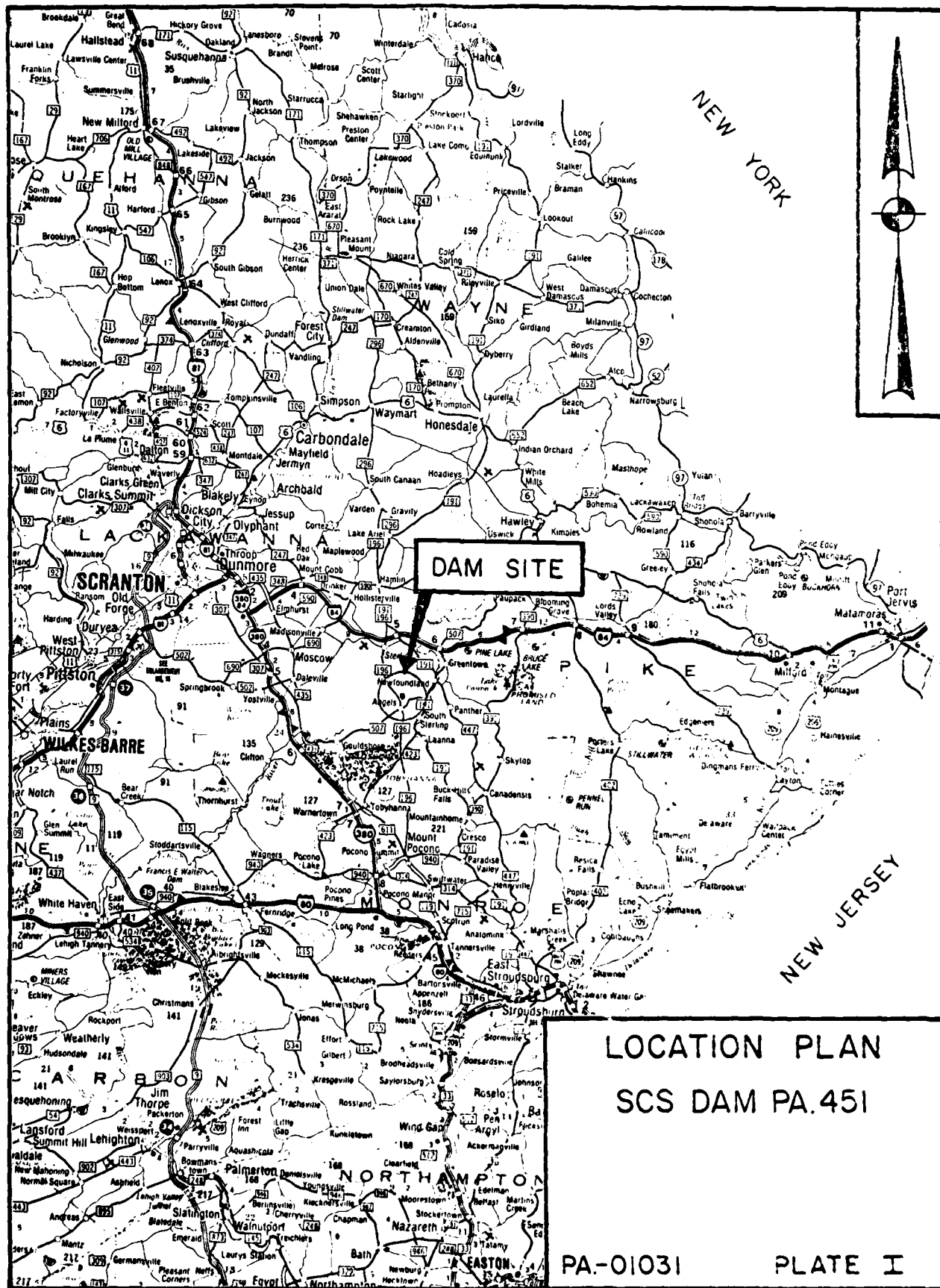
RATIO OF PAF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1899.80	0.00	164.	1252.	0.00	41.45	0.00
.80	1899.34	0.00	154.	968.	0.00	41.50	0.00
.60	1898.70	0.00	142.	690.	0.00	41.75	0.00
.50	1898.35	0.00	133.	542.	0.00	42.00	0.00
.40	1897.93	0.00	127.	378.	0.00	42.50	0.00
.30	1897.33	0.00	116.	216.	0.00	43.25	0.00
.20	1895.97	0.00	90.	88.	0.00	44.75	0.00
.15	1894.88	0.00	71.	56.	0.00	44.50	0.00
.10	1894.00	0.00	56.	14.	0.00	48.75	0.00

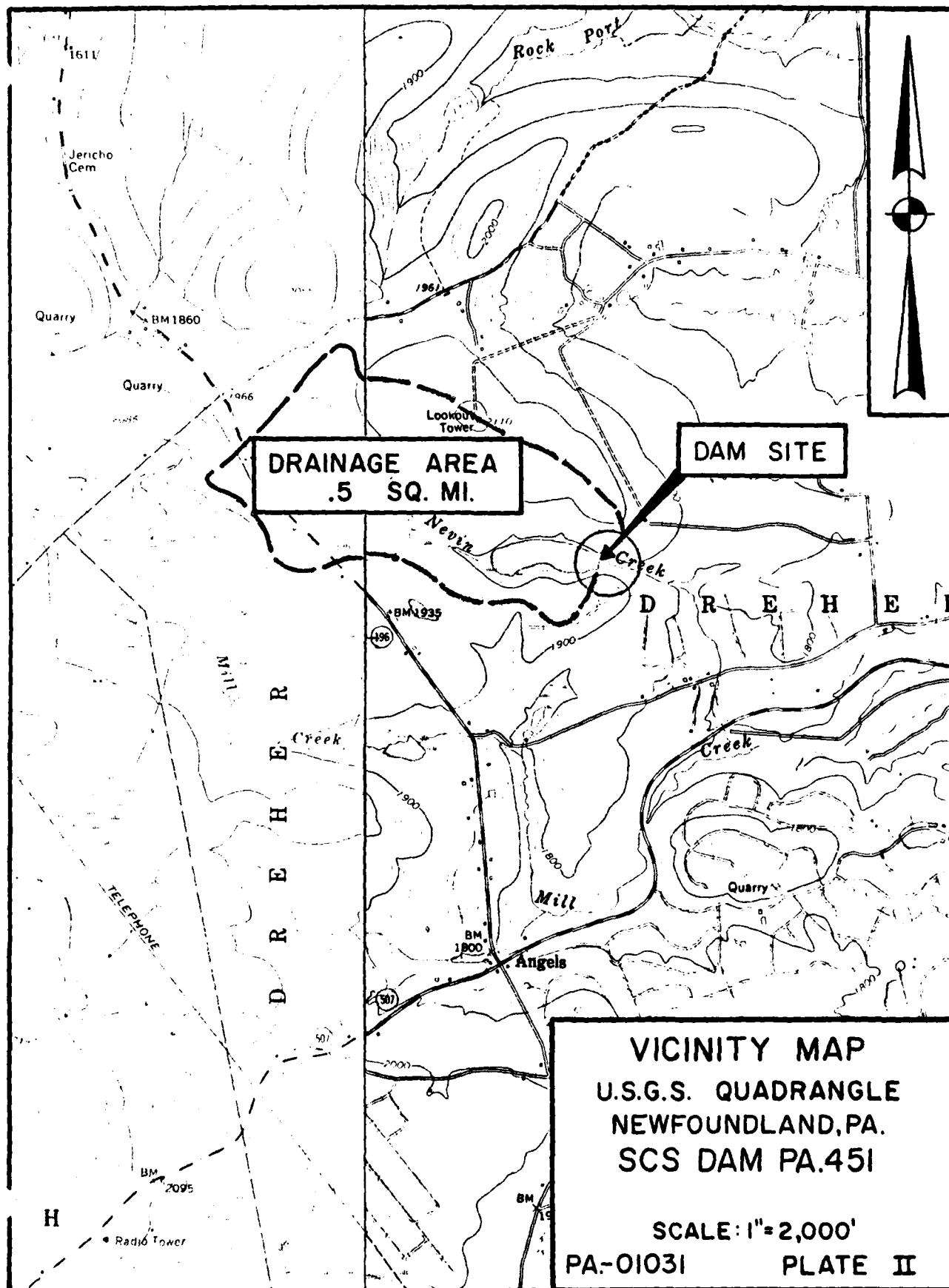
E31 ENCOUNTERED.
 h>

APPENDIX E

PLATES

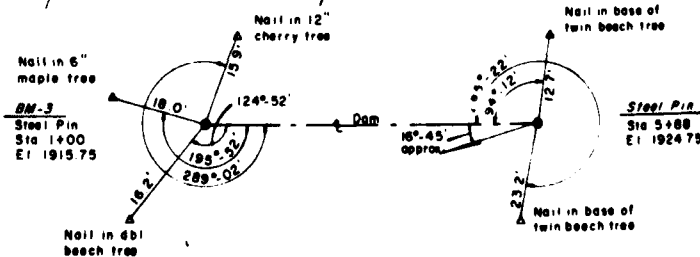
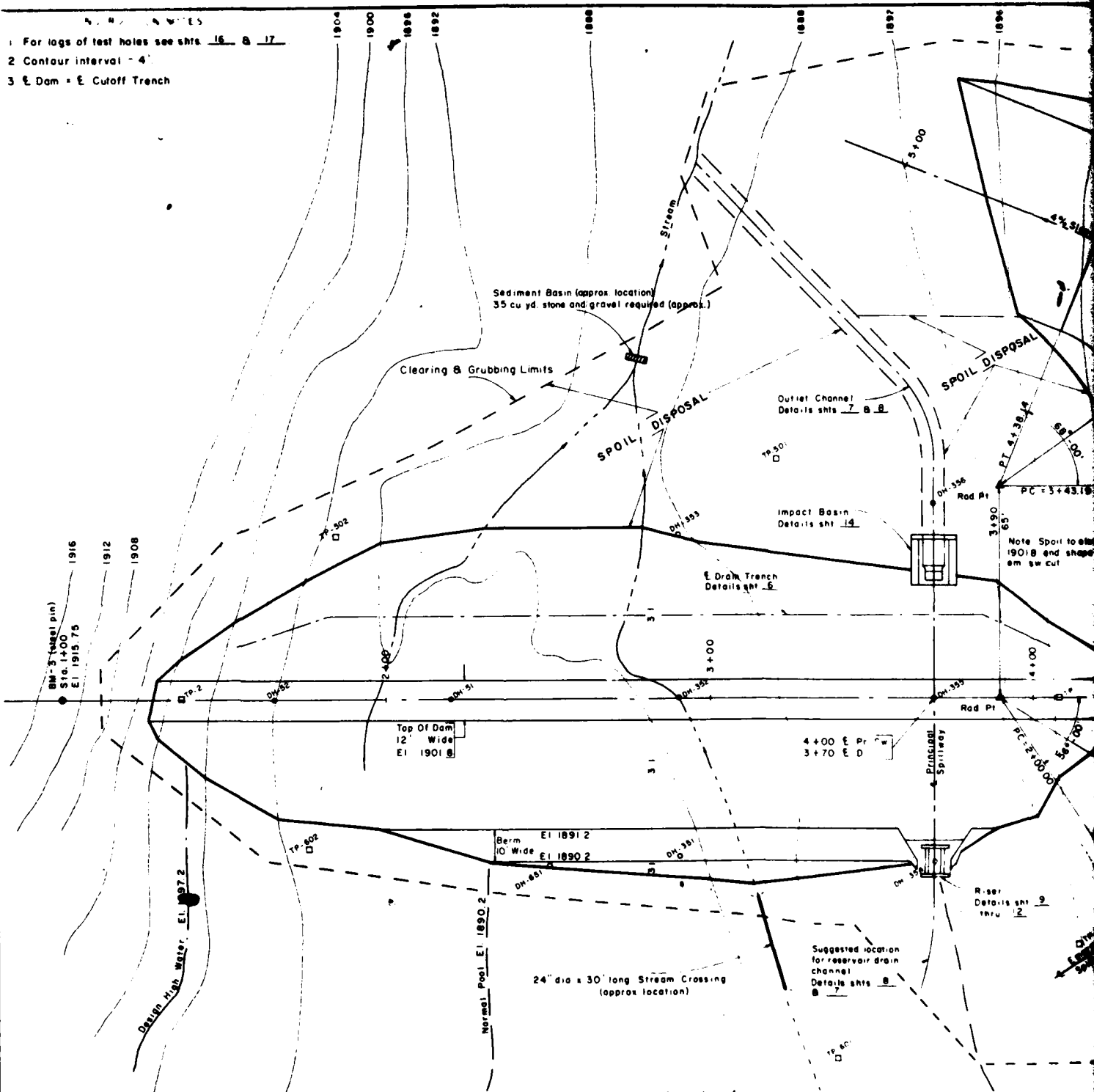
APPENDIX E





NOTES

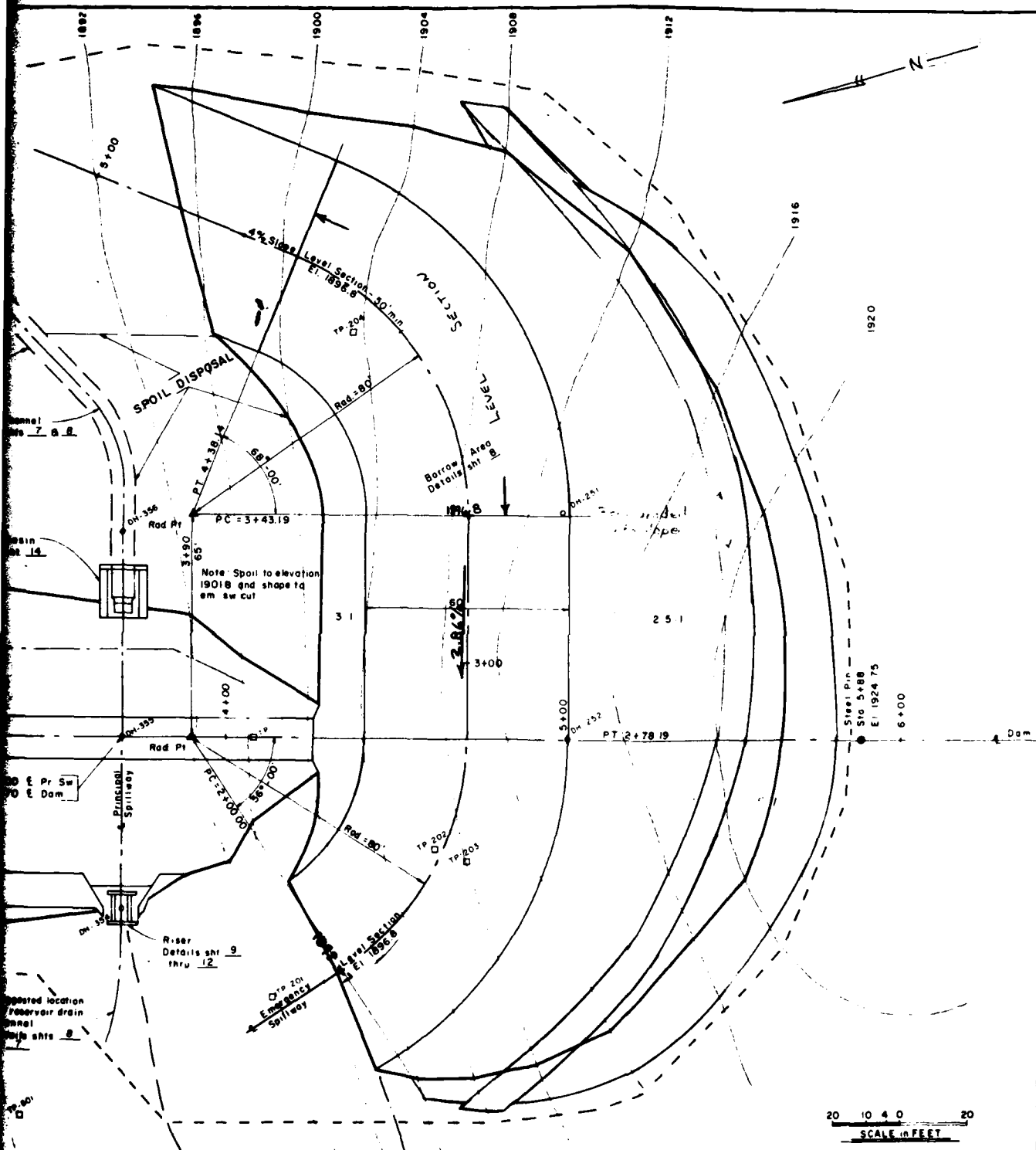
- 1 For logs of test holes see shrs. 16 & 17
- 2 Contour interval - 4'
- 3 E Dam = E Cutoff Trench



E DAM LAYOUT
NOT TO SCALE

EMERGENCY SPILL

DOWNSTREAM CURVE		
Station	Deflection	Chord
PC 3+43.19	0°-00'	-
3+66.93	8°-30'	23.649
3+90.66	17°-00'	-
4+14.40	25°-30'	-
PT 4+38.14	34°-00'	-
I = 68°		T = 53.961
R = 80'		
E = 16.497'		
M = 13.677'		
C = 89.470'		
L _s = 94.948'		



EMERGENCY SPILLWAY CURVE DATA

DOWNSTREAM CURVE

Station	Deflection	Chord
PC 3+43.19	0°-00'	-
3+66.93	8°-30'	23.649'
3+90.66	17°-00'	-
4+14.40	25°-30'	-
PT 4+38.14	34°-00'	-

T = 53.961

UPSTREAM CURVE

Station	Deflection	Chord
PC 2+00.00	0°-00'	-
2+19.55	7°-00'	19.499'
2+39.10	14°-00'	-
2+58.64	21°-00'	-
PT 2+78.19	28°-00'	-

T = 42.537

AS BUILT PLANS

GREENE DREHER WATERSHED

FLOODWATER RETARDING DAM PA-451

WAYNE COUNTY, PENNSYLVANIA

PLAN OF STRUCTURAL WORKS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

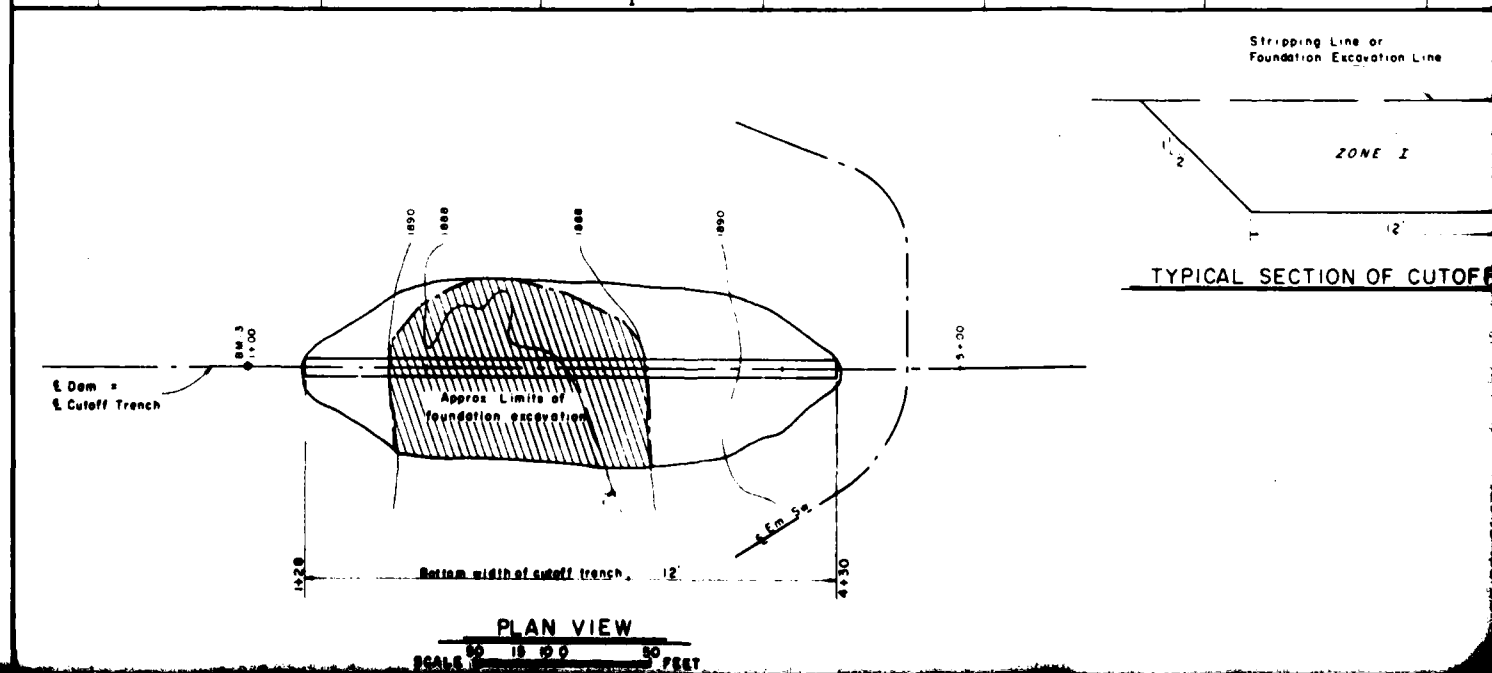
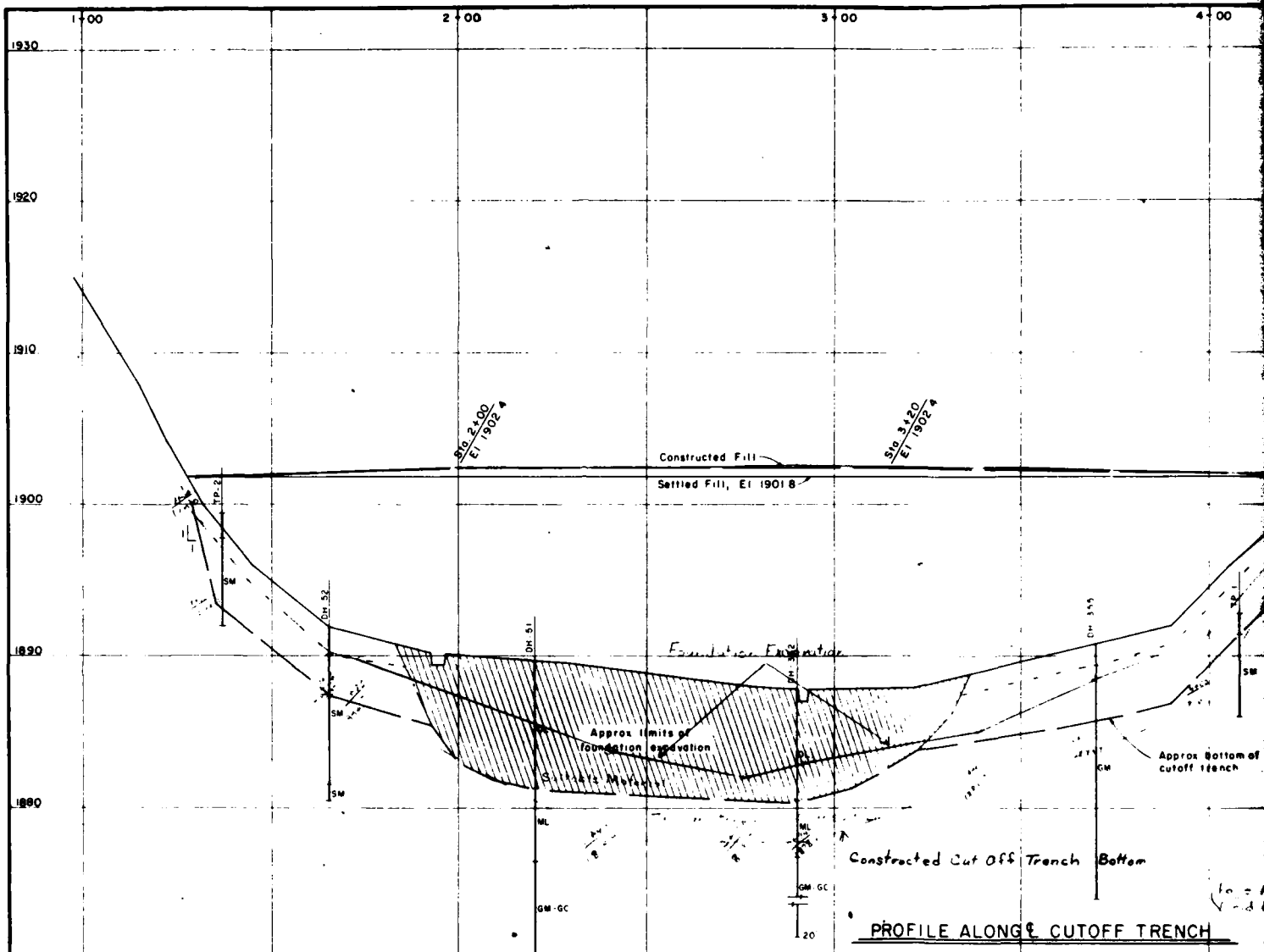
J. E. Van Sledright 4-70

C. CRISK 5-70

J. Graham 2-70

PA-451-P

PA-01031
PLATE II



TP 1. ELEV. 1989.5, 4270, 32' US. Centerline
Logged by: R. C. Page, 2/9/70

0.0 1.0 Topsoil, Max. size 2.5'
1.5 7.0 Gravel, silty
Max. 2.0' flaggy sandstone
Approx. 10% gravel, 5% 3-6", 65%
matrix (which is approx.
30% gravel, 40% sand, 30%
slightly plastic fines)
Orange-brown; moist; slightly
permeable; loose; non-
stratified; till; SM
7.0 Bottom of hole
NOTES: 1. Very small amount of
water entered hole near
top of rock.
2. Gray brown at 5.0'.
3. V. stony below 4.0'

TP 2. ELEV. 1989.5, 4277, Centerline
Logged by: R. C. Page, 2/11/70

0.0 1.5 Topsoil,
Very stony, mostly waste
1.5 6.0 Sand, silty
Max. 3.0' flaggy sandstone
Approx. 15% gravel, 5% matrix
(which is approx. 20%
gravel, 30% sand, and 50%
slightly plastic fines)
Orange-brown; moist; slow
permeability; dense; homo-
geneous; prev. till; SM
6.0 D.S. 2.1 Composite
Bottom of hole - GM

TP 3. ELEV. 1989.5, 4274, 75' US. Base, Spn.
Logged by: R. C. Page, 2/9/70

0.0 1.5 Topsoil
1.5 6.0 Sand, silty;
Max. 3.0' flaggy sandstone.
Approx. 10% 3-6", 5% matrix
(which is approx. 40%
gravel, 30% sand, and 30%
slightly plastic fines)
Mottled brown; moist; slight
permeability; somewhat homo-
geneous; till or colluvial;
SM
6.0 Bottom of hole - essentially dry
NOTES: 1. Color change at 3.0
to gray-brown.
2. Very little water on
top of rock
3. Thin sandstone
decomposed at it.

TP 202. ELEV. 1987.5, 4292, 32' US. Base, S.W.
Logged by: R. C. Page, 2/11/70

0.0 1.0 Topsoil
1.5 6.0 Gravel, silty
Max. 3.5' flaggy sandstone
Approx. 20% gravel, 25% 3-6", 75%
matrix (which is approx. 40%
gravel, 30% sand, 30%
slightly plastic fines)
Brown; moist; v. slow permea-
bility; dense; homogeneous;
glacial till; GM
6.0 D. S. 202.1 Composite Sample
Bottom of hole - dry
NOTES: 1. Moisture sample taken;
2. Boulders not as large
as general.
3. Digging fair; diffi-
cult.

TP 201. ELEV. 1989.5, 4270, 35' US. Base, Spn.
Logged by: R. C. Page, 2/12/70

0.0 1.5 Topsoil
1.5 4.0 Gravel, silty;
Max. 3.0' flaggy sandstone;
Approx. 20% gravel, 5% 3-6", 75%
matrix (which is approx. 40%
gravel, 30% sand, 30%
slightly plastic fines)
Brown; moist; v. slow permea-
bility; dense; homogeneous;
glacial till; GM
4.0 D. S. 201.1 Composite Sample
Bottom of hole - dry
NOTES: 1. Very bouldery
pieces are generally
larger than TP 202.
2. Refused because of
boulders on 3 sides
of hole.

TP 204. ELEV. 1987.5, 4276, 32' US. Base, Spn.
Logged by: R. C. Page, 2/11/70

0.0 1.5 Topsoil
1.5 6.0 Gravel, sandy
Max. 2.5 flaggy sandstone
Approx. 10% gravel, 5% 3-6", 85%
matrix (which is approx. 40%
gravel, 30% sand, 30% slightly
plastic fines)
Brown; moist; v. slow permea-
bility; dense; homogeneous;
glacial till; GM
6.0 Bottom of hole - dry

TP 501. ELEV. 1989.5, 4272, 32' US. Base, Spn.
Logged by: R. C. Page, 2/9/70

0.0 1.5 Topsoil and muck, Max. size 3.0'
1.5 3.5 Gravel, silty
Max. 2.0' flaggy, Approx. 15% gravel,
5% 3-6", 80% matrix (which is
approx. 50% gravel, 25% sand
25% fines)
Gray; saturated; very permeable;
loose; non stratified; allu-
vium; GM
3.5 6.5 Sand-silty-gravelly
Max. 2.0' flaggy sandstone
Approx. 35% gravel, 5% 3-6", 60%
matrix (which is approx. 40%
gravel, 25% sand, 35% slightly
plastic fines)
Gray; saturated; v. low permea-
bility; dense; till; SM
6.5 Bottom of hole -

TP 502. ELEV. 1989.5, 4285, 30' US. Base, Spn.
Logged by: R. C. Page, 2/11/70

0.0 1.5 Topsoil
1.5 4.0 Sand-gravelly, Max. 2.0'
Approx. 25% gravel, 5% matrix
(which is approx. 25% gravel,
50% sand, 15% non-plastic fines)
Mottled; moist; slow; non-loose;
Residual colluv. SM
4.0 D. S. 3.5, 502.1. SM
4.0 6.5 Sand-silty
Max. size 4.0'
Approx. 35% gravel, 5% 3-6", 60%
matrix (which is approx. 30%
gravel, 30% sand, 50% slightly
plastic fines)
Gray; moist; v. slow permeability;
dense; homogeneous; till; SM
6.5 D. S. 6.0, 502.2 - GC-GM
NOTES: Water entering hole from
surface
6.5 Bottom of hole

TP 601. ELEV. 1989.5, 4280, 110' US. Other
Logged by: R. C. Page, 2/9/70

0.0 2.0 Muck
10% gravel, 90% matrix (which is
approx. 50-75% coarse material)
Gray to black; saturated; rapid
permeability; loose; alluvium;
GM
2.0 6.0 Sand-silty
Max. 2.5' flaggy sandstone
Approx. 10% gravel, 5% matrix
(which is approx. 40% gravel, 25%
sand, 35% slightly plastic fines)
Gray; saturated; v. slow permeability;
dense; blocky; till; SM
6.0 Bottom of hole -
NOTES: 1. Hole filled rapidly with
water and caved badly.
2. Very difficult to get any
sample or idea of material
in top 2.0'.

TP 602. ELEV. 1989.5, 4278, 40' US. Other
Logged by: R. C. Page, 2/11/70

0.0 2.5 Topsoil and Fill, Max. 2.5
2.5 3.5 Sand-gravelly
Max. 1.0'
Approx. 35% gravel, 5% 3-6", 60% matrix
(which is approx. 25% gravel,
15% sand, 60% slightly plastic
fines)
Gray; saturated; slow permeability;
dense; slightly stratified;
lacustrine; SM

TP 602. cont'd.

3.5 7.0 Max. 2.0'
10% gravel, 90% matrix (which is
approx. 40% gravel, 30% sand,
30% slightly plastic fines)
Brown; moist; v. slow permea-
bility; dense; homogeneous;
till;
7.0 Bottom of hole
NOTES: 1. Water in fill, filling
hole
2. Sides caving badly

TP 51. ELEV. 1989.5, 4270, Centerline of Run
Logged by: R. C. Page, 2/11/70
Drilling Equipment: Mobile B-2

Mole Depth From To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION			Type Soil	No.
			Blows/ft	N	Used		
0.0 6.5	Topsoil, litter, muck & fill		75/3			Tri	1
6.5 13.5	Silt-sandy; 10% gravel, 25% sand, 65% fines; slightly plastic; odorless; gray; wet; very slow permeability (0.0-0.04 feet/day); stiff (w=43); faint stratifi- cation; lacustrine	ML	27-21-25-6 12-9-10 12-10-27 15-12-13-19 13-61-65	46 19 43 25 126		S t	2
13.5 20.0	Gravel-silty-clayey; 40% gravel, 25% sand, 35% fines; slightly plastic (PI=6); odorless; urn; moist; very slowly permeable; dense (w=60-204); non stratified; glacial till.	GM-GC	01-61-37 27-27-33 03-111-93-105	90 40 204		7 8 9	

Notes: 1. Poor sample recovery
prob. result of the
wet or soupy condition
2. Hole caved below 4.0'

ML - 2.5', 2/26/70

TP 52. ELEV. 1989.5, 4265, Left Abutment - Centerline
Logged by: R. C. Page, 2/26/70
Drilling Equipment: Mobile B-2

Mole Depth From To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION			Type Soil	No.
			Blows/ft	N	Used		
0.0 2.0	Topsoil, boulders, etc		4-6-16	20		S t	1
2.0 10.5	Sand-silty; 20% gravel, 30% sand, 50% fines; slightly plastic; orange-brown to brown; moist; moderately high permeability (0.17-0.25/day); dense (w=24-50), non stratified; glacial till	SM	9-10-19 30-55-95/2 13-17-27 7-65-61	20 150/7 44 121		2 3 4 5	
10.5 11.5	Sand-silty; 10% gravel, 10% fine and medium sand, 30% fines; non- plastic; Lt. brown; wet; moderate permeability; dense; non stratifi- fied; old stream channel	SM				Tri	6

Notes: 1. Heavy Boulder content
in top 2.0', some
colluvial
2. Hole caved below 2.5'

ML - ? Probably around 3.0'

TP 251. ELEV. 1914.2, 4290, Base, Spn.
Logged by: R. C. Page, 2/9/70
Drilling Equipment: Mobile B-2

Mole Depth From To	Description of Materials	Unif. Soil Class Symb.	STANDARD PENETRATION			Type Soil	No.
			Blows/ft	N	Used		
0.0 1.5	Topsoil, litter, etc.		4-5-22	27		Spt	
1.5 20.0	Gravel-silty; 40% gravel, 30% sand, 30% fines; slightly plastic, brown; moist; very slow permeability; dense GM (w=35-105); non stratified; glacial till.		17-13-22 15-20-25 24-25-44 24-49-55 32-77-75	35 53 69 104 152			
20.0 -	NON					Tri	
	Notes: 1. Fill becomes dark brown w/ slightly more gravel at 18.5'. 2. May be an old topsoil horizon or decomposed boulders 3. Hole caved below 11.3'		27-64-42 08-43-62 90-42-45 31-32-61 21-38-125 34-80-89-76	106 105 87 93 157 169		Spt	

ML - Dry, 2/26/70

PA 451, ELEV. 1000.0, 5+00, BARRINGTON SPILLWAY, CENTERLINE
 Logged by: R. C. Page, 2/24/70
 Drilling Equipment: SPM 400

Hole	Depth	Description of Materials	Unit Soil Class	STANDARD PENETRATION			SAMPLES			
				Blows/ft	N	Type	From	To	Feet	Rec.
0.0	1.5	Topsoil, litter, etc.		1-3-4	1	Spt	1	Jan	1.5	20
1.5	20.0	Gravel, silty; 40% gravel; 30% sand; 30% fines; slightly plastic; brown; moist; very slow permeability; dense (n=59-76); non stratified; CM glacial till.		10-3-4	1	Tri	2	Jan	2.0	20
				130/1.5	3	Tri	3	Jan	3.0	20
				21-24-31	74	Spt	4	Jan	5.0	7.0
						Tri	5	Jan	5.0	7.0
20.0	-	EOH		25-29-32	10	Spt	6	Jan	6.0	7.0
				10-19-40	30	Tri	7	Jan	7.0	7.0
				27-37-72-94	129	Spt	8	Jan	12.0	40.0

Notes: 1. Last sample has less fines, at 10' hole sample
 2. Hole caved below 7.5'

WL - Dry, 2/26/70

PA 351, ELEV. 1000.0, 2+30, CENTERLINE, BARRINGTON SPILLWAY, CENTERLINE, 50' TO
 Logged by: R. C. Page, 2/24/70
 Drilling Equipment: Mastic B-30

Hole	Depth	Description of Materials	Unit Soil Class	STANDARD PENETRATION			SAMPLES			
				Blows/ft	N	Type	From	To	Feet	Rec.
0.0	7.5	Topsoil, muck, and fill		4-4-47	31	Spt	1	Jan	7.5	25
7.5	14.5	Silt-sand; 10% gravel, 25% sand; 65% fines; slightly plastic; gray; wet; very slow permeability; stiff (n=15-22); faint stratification; lacustrine.		44-75	73/2.5	2	Jan	8.0	8.0	25
				21-24	6	Tri	3	Jan	9.0	25
				27-28-3	5	Tri	4	Jan	9.5	25
				27-28-12	3	Tri	5	Jan	10.0	25
				2-3-7	15	Tri	6	Jan	10.5	25
14.5	17.5	Gravel-silty; 45% gravel, 30% sand; 25% fines; slightly plastic; gray; moist; very slow permeability; dense (n=59-156); non stratified; glacial till.		2-3-12	15	Tri	7	Jan	11.0	25
				2-3-13	22	Tri	8	Jan	11.5	25
				7-9-14	23	Tri	9	Jan	12.0	25
				10-15-44	54	Tri	10	Jan	13.0	25
				50-75/2	75/2	Tri	11	Jan	13.5	25
17.5	-	EOH		31-36-35/3	137/3	Tri	12	Jan	14.0	25

Notes: 1. Hole caved below 8.5'

WL - 2.0, 2/26/70

PA 352, ELEV. 1000.0, 2+30, CENTERLINE, BARRINGTON SPILLWAY, CENTERLINE, 50' TO
 Logged by: R. C. Page, 2/25/70
 Drilling Equipment:

Hole	Depth	Description of Materials	Unit Soil Class	STANDARD PENETRATION			SAMPLES			
				Blows/ft	N	Type	From	To	Feet	Rec.
0.0	7.5	Topsoil, muck and fill		4-4-47	31	Spt	1	Jan	7.5	25
7.5	11.2	Silt-sand; 10% gravel, 25% sand; 65% fines; slightly plastic; gray; wet; slow permeability (n=15-20); stratification; lacustrine.		44-75	73/2.5	2	Jan	8.0	8.0	25
				21-24	6	Tri	3	Jan	9.0	25
				27-28-3	5	Tri	4	Jan	9.5	25
				27-28-12	3	Tri	5	Jan	10.0	25
				2-3-7	15	Tri	6	Jan	10.5	25
11.2	20.0	Gravel-silty; 45% gravel, 30% sand; 25% fines; slightly plastic (PI-5); gray; moist; very slowly permeable (n=4-5.3/day); dense (n=31-100); non stratified; lacustrine till.		2-3-12	15	Tri	7	Jan	11.0	25
				2-3-13	22	Tri	8	Jan	11.5	25
				7-9-14	23	Tri	9	Jan	12.0	25
				10-15-44	54	Tri	10	Jan	13.0	25
				50-75/2	75/2	Tri	11	Jan	13.5	25
20.0	-	EOH		31-36-35/3	137/3	Tri	12	Jan	14.0	25

Notes: 1. Hole caved below 3.5'

WL - 2.5, 2/26/70

PA 353, ELEV. 1000.0, 2+30, CENTERLINE, BARRINGTON SPILLWAY, CENTERLINE, 50' TO
 Logged by: R. C. Page, 2/25/70
 Drilling Equipment: Mastic B-30

Hole	Depth	Description of Materials	Unit Soil Class	STANDARD PENETRATION			SAMPLES			
				Blows/ft	N	Type	From	To	Feet	Rec.
0.0	2.0	Topsoil, litter, etc.		4-4-47	31	Spt	1	Jan	2.0	20
2.0	16.0	Gravel-silty; 40% gravel, 25% sand; 35% fines; slightly plastic (PI-5); gray; moist; very slowly permeable; dense (n=22-93); non stratified; glacial till.		7-15-7	22	Tri	2	Jan	2.5	20
				15-17-14	31	Tri	3	Jan	3.0	20
				15-17-14	34	Tri	4	Jan	3.5	20
				15-17-14	31	Tri	5	Jan	4.0	20
				15-17-20	59	Tri	6	Jan	4.5	20
				40-35-20	61	Tri	7	Jan	5.0	20
				40-35-20	97	Tri	8	Jan	5.5	20
				40-35/2	50	Tri	9	Jan	6.0	20
				31-40-45	93	Spt	10	Jan	6.5	20
				40-37-43	50	Tri	11	Jan	7.0	20

Notes: 1. Hole caved below 5.0'

WL - 2.0, 2/26/70

GREENE-DREHER WATERSHED FLOODWATER RETARDING DAM PA-451

WAYNE COUNTY, PENNSYLVANIA

LOGS OF TEST HOLES

U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

By: Ronald C. Page 2/70 STATE CONS. ENGINEER

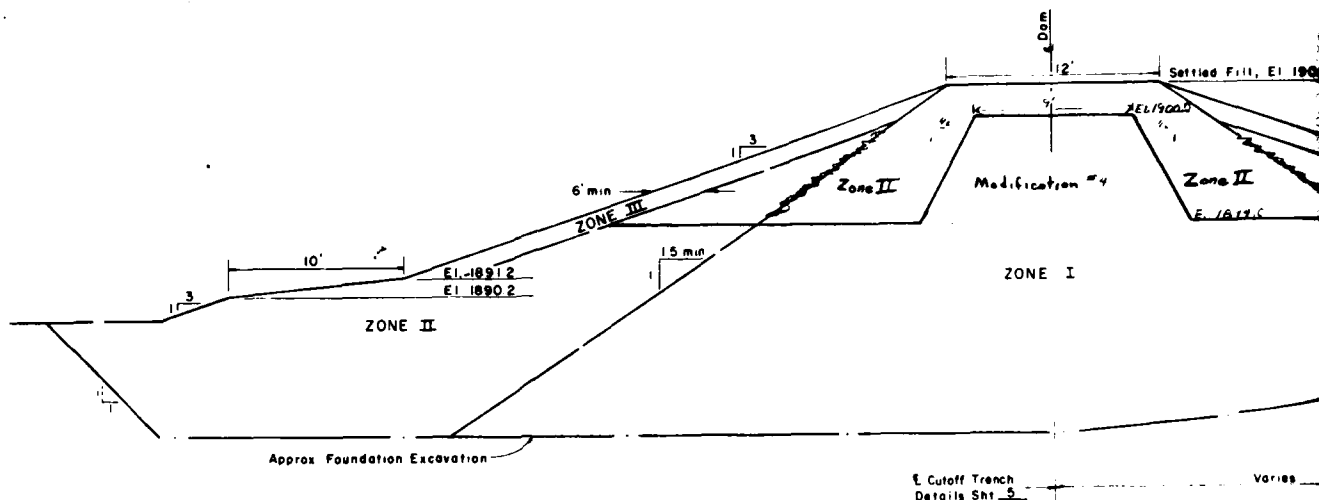
By: Shashana Barr 3/70

PA-451-P

PA-01031
 PLATE V

AS BUILT PLANS

Laboratory Classification



Zone II: As noted and built in red above El. 1894.0 of

SELECTIVE PLACEMENT	MATERIAL	MAX ROCK SIZE	MAX LIFT ¹	REQ'D WATER CONTENT ²	COMPACTION ³	
					CLASS	DEFINITION
ZONE I	Material as represented by TP-202 I, Classified as GC-GM	6"	9"	Optimum ⁴ - 2% to + 3%	A	95% Max density by ASTM D-698, Method "A"
ZONE II	Coarse grained material raked from ZONE I	12" 24"	16" 24"	Compact with min. of six passes of 250 PSI sheep foot per lift		
ZONE III	Topsoil or other fine grained material (OL, ML from foundation)	6"	9"	Compact with min. of four passes of 250 PSI sheep foot per lift		

¹ Maximum permissible lift thickness before compaction

² Water content of fill matrix at time of compaction

³ For typical compaction curves see Sht. 18

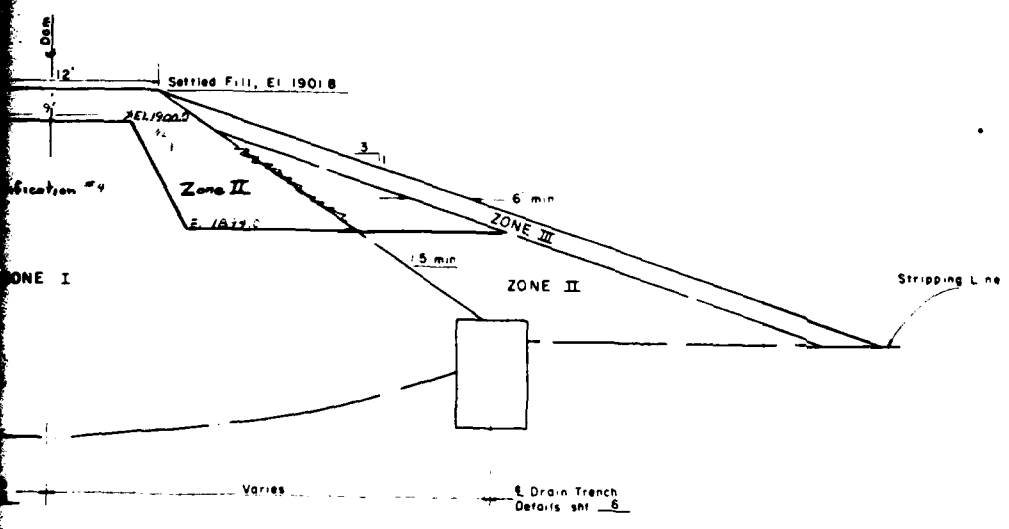
⁴ Moist content to be approved by the Engineer

⁵ Voids will not be permitted between boulders

⁶ Variation in moisture content to be approved by Engineer

⁷ Changes in rock size and those indicated by notes #5 & #6 were permitted by Contract Modification #4

L
B-1



ON OF DAM
5
1

CONSTRUCTION NOTES

- For constructed fill elevations see shd. 5
2. Constructed slopes are
- | | |
|-----|------------|
| 2:9 | Upstream |
| 2:9 | Downstream |

built in red above El. 1894.0 after Contract Modification #4

AS BUILT PLANS

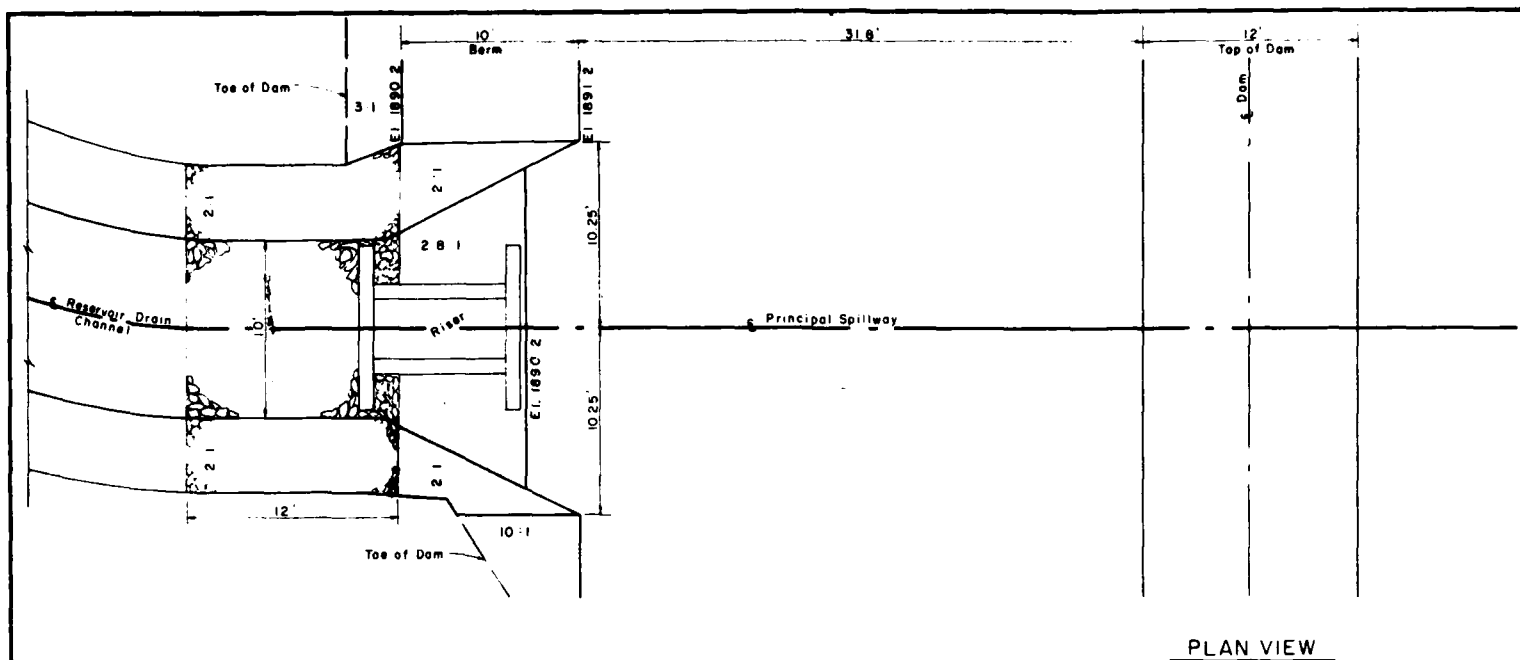
GREENE - DREHER WATERSHED
FLOODWATER RETARDING DAM PA-451
WAYNE COUNTY, PENNSYLVANIA
FILL PLACEMENT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

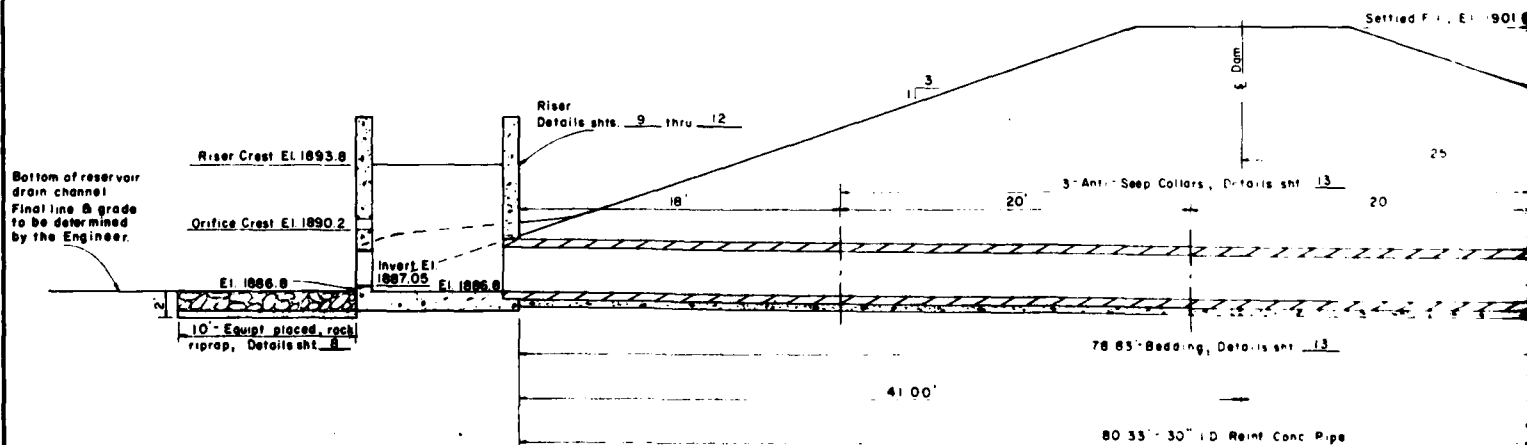
Wall & Van Buren 4-70
C. CRIGG 5-70

J. Graham 7-70 PA-451-P

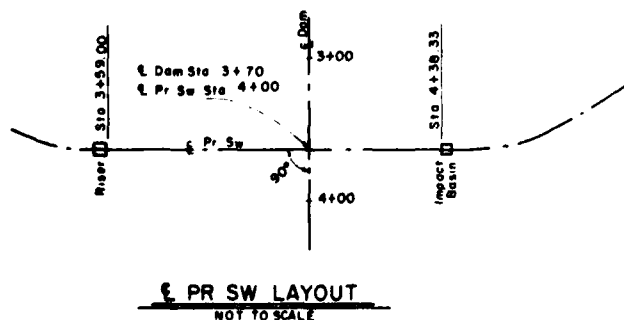
PA-01031
PLATE VI



PLAN VIEW



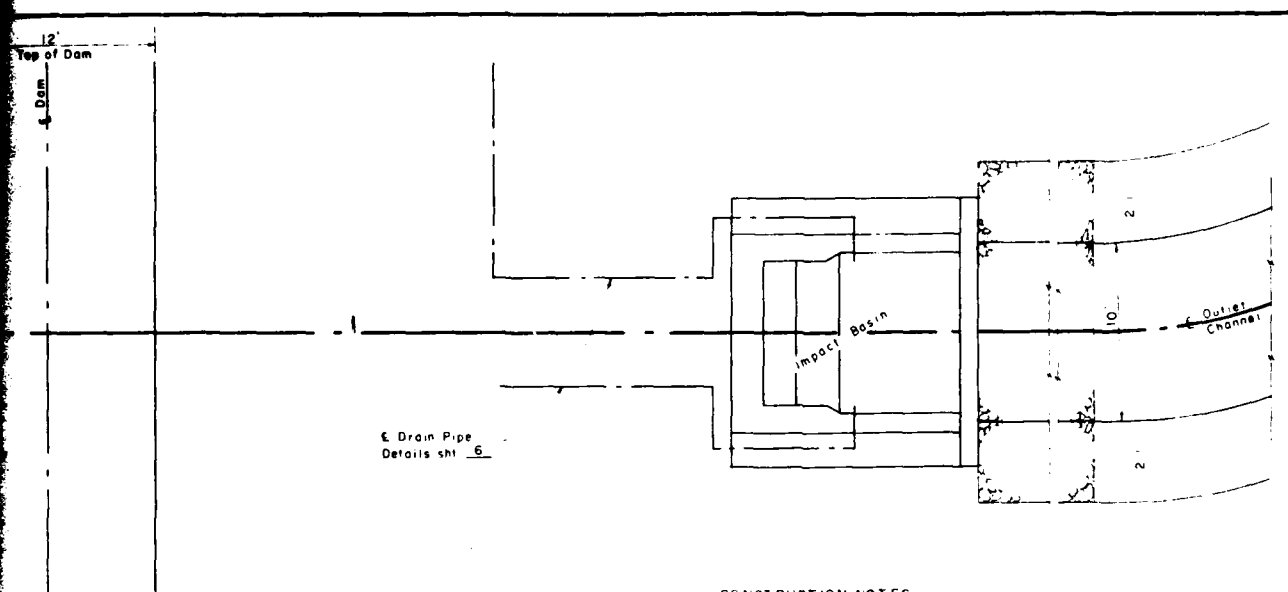
PROFILE ALONG E. PRINCIPAL SPILLWAY



E. PR SW LAYOUT
NOT TO SCALE

- 30" I.D. Reinforced Concrete Pressure Pipe Steel Cylinder Type I (Spec. 541) - AWWA C-300 or C-301
- 80' - Straight sections
 - 1 - Spigot ring wall fitting (for 10" wall)
- Pressure head = 15'
- Load = 9,639 lbs per lin ft
- Min. 3 edge bearing strength for:
- 0.01" Crack non-prestressed pipe = 4,714 lbs per lin ft
 - 0.001" Crack prestressed pipe = 3,544 lbs per lin ft
- 80.33' Total
- Based on O.D. of 2.96

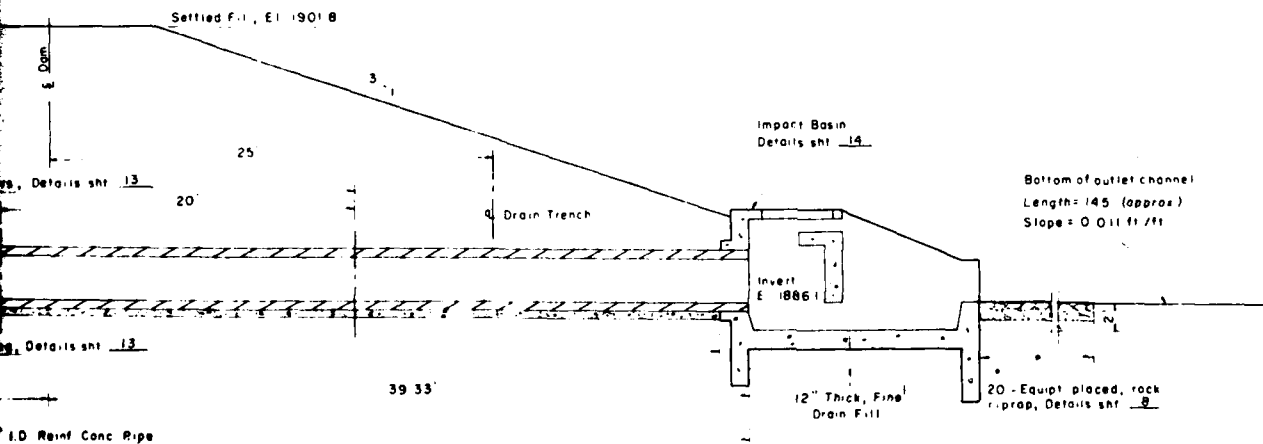
Note: Where pipe furnished has an outside diameter greater than that called for on the plans, the 3 edge bearing strength must equal or exceed the specified strength multiplied by the ratio of the outside diameter furnished to the outside diameter specified.



CONSTRUCTION NOTES

1. Outlet end of pipe to be finished so that no metal is exposed
2. Pipe layout data will be furnished by the Engineer

PLAN VIEW



6" & PRINCIPAL SPILLWAY

AS BUILT PLANS

Type (Spec 541) - AWWA C-300 or C-301

30" ID PIPE JOINT DATA (As Built)

Joint	Dist. From Risin Wall	Invert Elevation
1	0.32	1886.7
2	46.52	1886.5
3	60.33	1886.3
4	80.33	1886.1

Collar DATA, FOR 30" PIPE (As Built)

Collar	Dist. From Risin Wall	Invert Elevation
1	1.9	1886.1
2	3.9	1886.1
3	5.9	1886.1

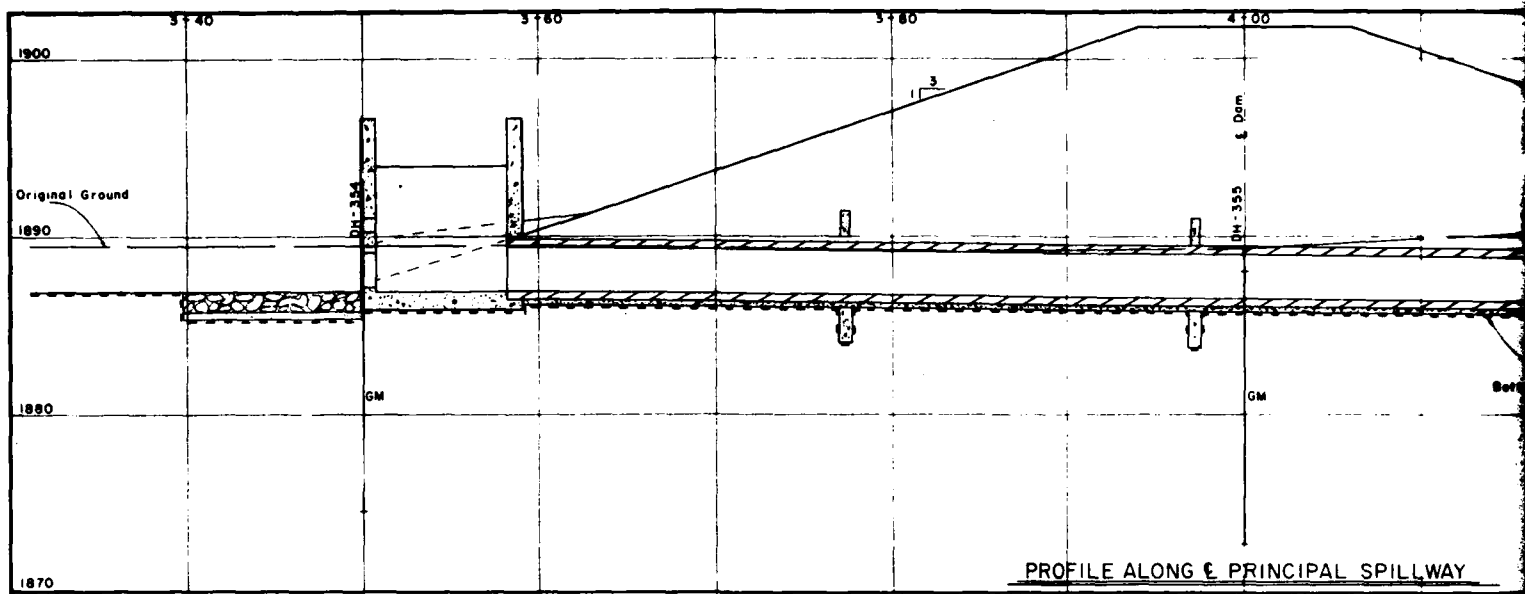
5 3 1 0 5
SCALE in FEET

GREENE DREHER WATERSHED
FLOODWATER RETARDING DAM PA-451
WAYNE COUNTY, PENNSYLVANIA
PRINCIPAL SPILLWAY
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

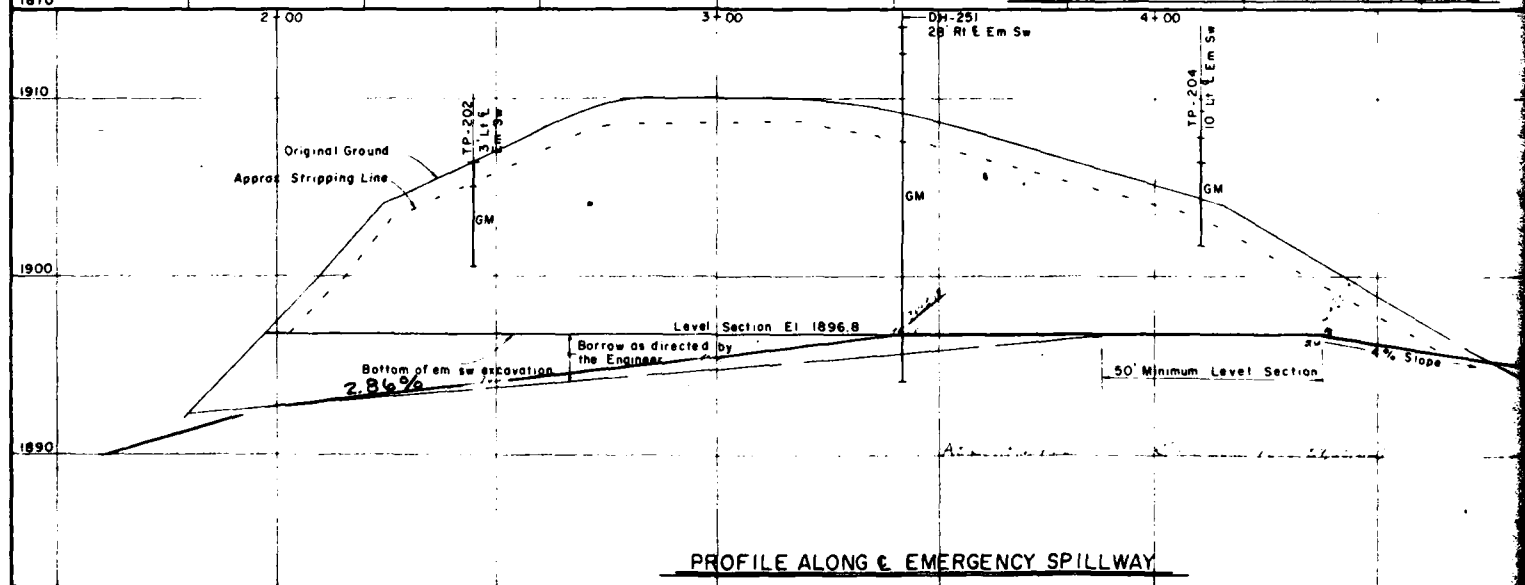
Wall 1 Van Buren 4-70
C CRISK 5-70

J. Graham 7-70 10 PA-451-P

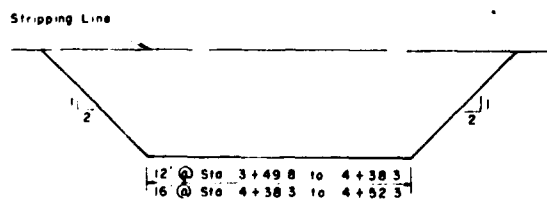
PA-01031
PLATE VII



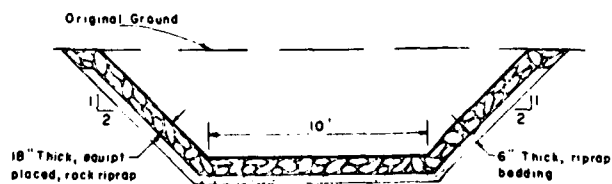
PROFILE ALONG & PRINCIPAL SPILLWAY



PROFILE ALONG & EMERGENCY SPILLWAY

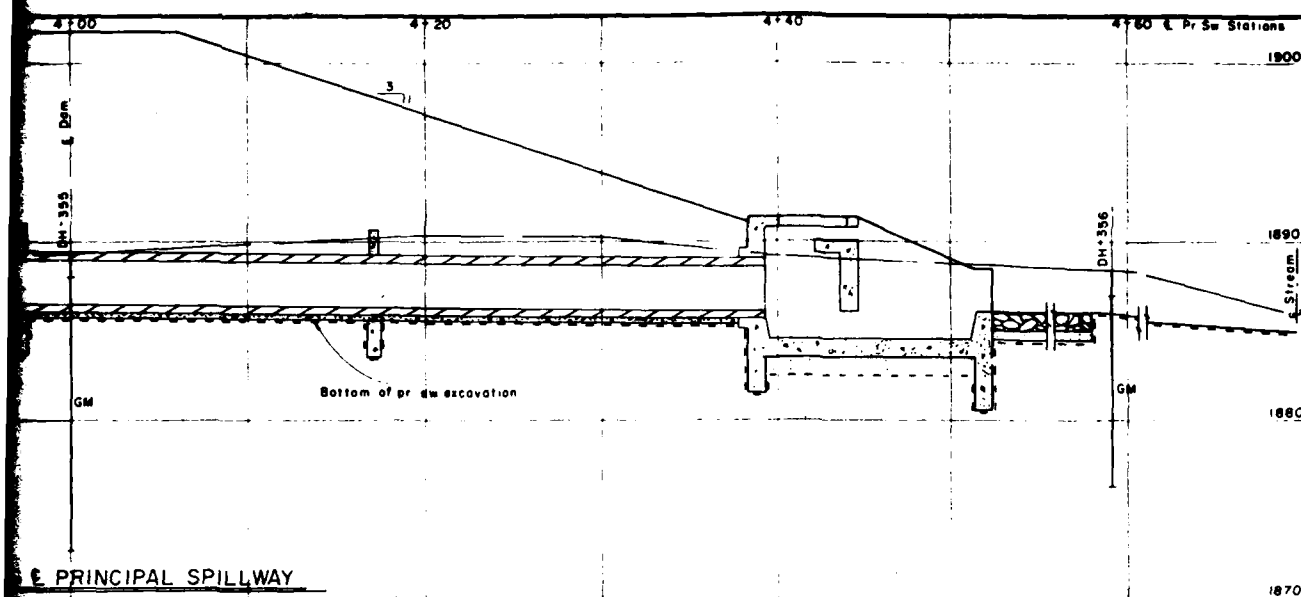


PR SW DETAIL

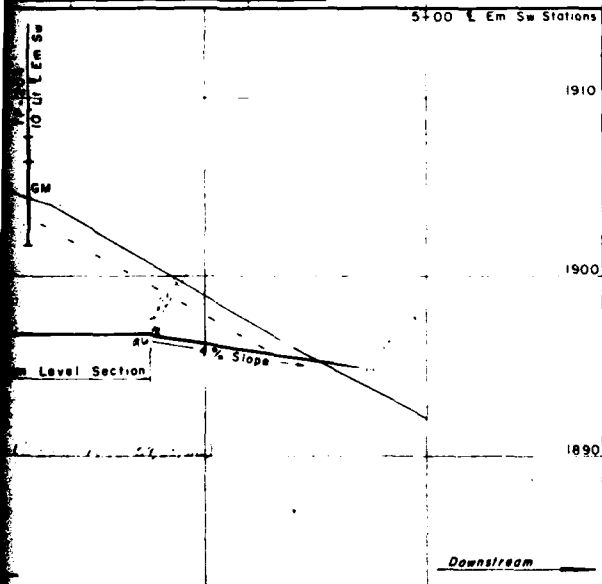


RESERVOIR DRAIN CHANNEL
& OUTLET CHANNEL
RIPRAP SECTION DETAIL

RESERVOIR
& OUTLET

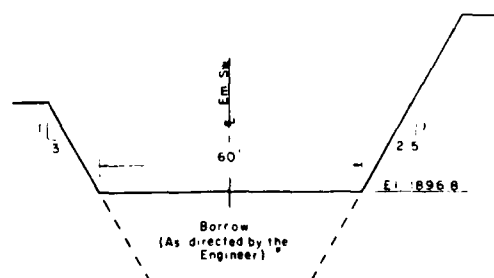


PRINCIPAL SPILLWAY

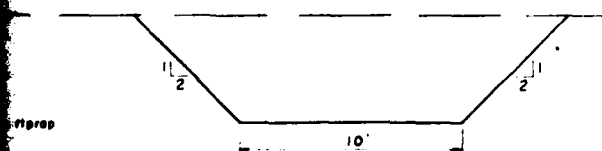


CONSTRUCTION NOTES

- 1 For logs of test holes see shts 16 & 17
- 2 For drain fill gradation limits see sht 6
- 3 Riprap bedding shall meet fine drain fill gradation limits



TYPICAL SECTION (Emergency Spillway Borrow)



RESERVOIR DRAIN CHANNEL & OUTLET CHANNEL

AS BUILT PLANS

GREENE DREHER WATERSHED
FLOODWATER RETARDING DAM PA-451
WAYNE COUNTY, PENNSYLVANIA
SPILLWAY EXCAVATION

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

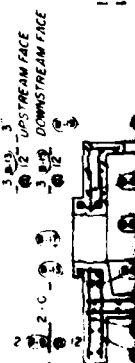
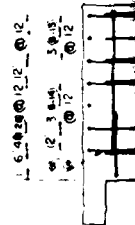
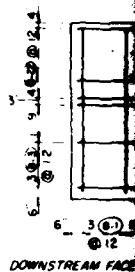
Wall & Van Buren 4-70
C. CRISE 5-70

J. Strickland

8-70

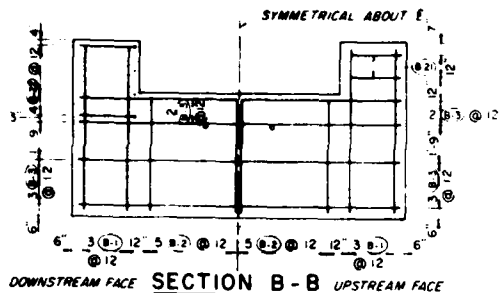
PA-451-P

PA-01031
PLATE VIII



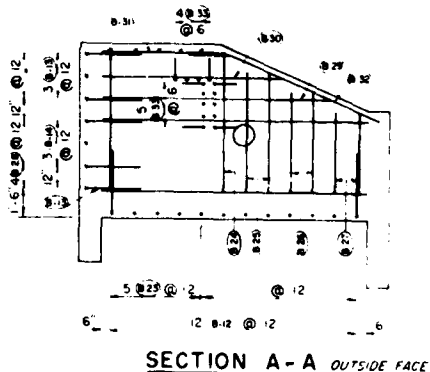
Construction Details.
See Spec 1-2

ABOUT E

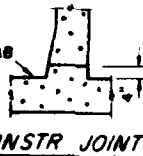


INSIDE FACE

ABOUT E

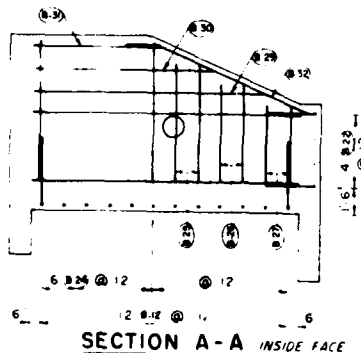


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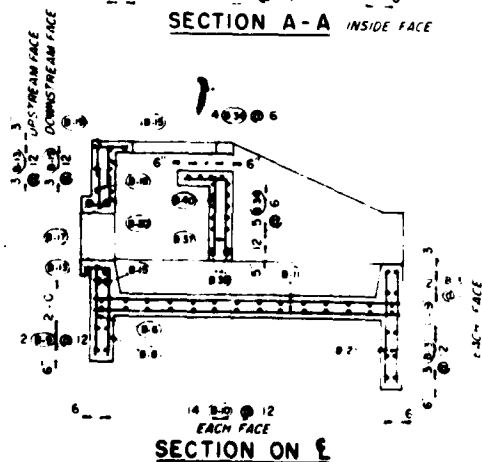


CONSTR JOINT

CONSTR JOINT



SECTION A-A INSIDE FACE

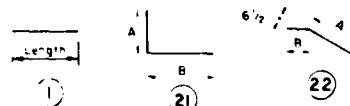


SECTION ON E

AS BUILT PLANS

STEEL SCHEDULE

BAR	LOCATION	QUANTITY	SIZE	LENGTH	TYPE	A	B	TOTAL FT
B-1	CUT OFF	12	5	7-3	1			87 00
2		16	5	5-0	1			90 00
3		10	5	14-6	1			145 00
4		8	5	2-6	1			20 00
B-5		8	5	10-8	21	9-4	1-4	85 33
6		3	5	4-0	1			12 00
7		8	5	9-3	1			74 00
8		3	5	5-0	21	4-0	1-0	15 00
9		4	5	14-6	1			58 00
B-10	FLOOR SLAB	28	5	14-6	1			406 00
11		30	5	13-6	1			405 00
12		48	5	3-10	21	2-10	1-0	184 00
13	INLET WALL	8	5	8-7	21	6-1	2-6	68 67
14		6	5	6-6	21	4-0	2-6	39 00
B-15		4	5	10-6	1			42 00
16		6	5	4-4	21	3-9	1-0	28 50
17		8	5	3-0	1			24 00
18		6	5	2-3	1			13 50
19		3	5	3-4	21	2-0	1-4	10 00
B-20		3	5	3-0	2	2-0	1-0	9 00
21	WING WALLS	4	5	2-6	1			10 00
22		8	5	5-0	2	2-6	2-6	40 00
23	SIDE WALLS	10	5	7-10	21	6-6	1-4	78 33
24		14	5	6-0	1			84 00
B-25		8	5	5-3	1			42 00
26		8	5	4-3	1			34 00
27		8	5	3-6	1			28 00
28		16	5	12-0	1			192 00
29		4	5	10-3	1			41 00
B-30		4	5	8-0	1			32 00
31		6	5	5-6	1			33 00
32		4	5	9-1	22	7-6	1-7	36 33
33	BAFFLE	28	5	4-0	2	3-0	1-0	112 00
34		14	5	8-0	1			112 00
B-35		4	5	5-0	2	3-0	2-0	20 00
36		2	5	4-5	2	2-5	2-0	8 83
37		3	5	5-7	2	3-7	2-0	16 75
38		6	5	3-0	1			18 00
39		2	5	2-5	1			4 83
B-40		3	5	3-6	1			10 50
41		8	5	2-0	1			16 00



BAR TYPES

QUANTITIES THIS SHEET ONLY

REINFORCING STEEL
NO. 5 BARS 2785 57 LBS. 2925 35 LBS.

CONCRETE
219 CUBIC YDS.

SCALE: 1" = 4'-0"

GREENE DREHER WATERSHED
FLOODWATER RETARDING DAM PA-451
WAYNE COUNTY, PENNSYLVANIA
IMPACT BASIN DETAILS
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Frank D. Dreher
ARCHITECT
C. B. FORD

F. O. Parker

PA-451-P

PA-01031
PLATE IX

APPENDIX F
GEOLOGIC REPORT

APPENDIX F

GEOLOGIC REPORT

Bedrock - Dam and Reservoir

Formation Name: Poplar Gap Member, Catskill Formation.

Lithology: Predominantly fine to medium-grained, gray sandstone, locally conglomeratic. Some interbeds of red siltstone and shale. Sandstones are generally well cemented with quartz, but calcareous cement is present at the base of some beds.

Structure

The site is within the Pocono Plateau area and the beds are essentially horizontal. Air photo fracture traces trend: N10° to 15°E, N60°W, and N70°W.

Overburden

The site is within the limits of Pleistocene glaciation and is underlain by quite thick deposits of glacial moraine and some lacustrine silts. The site is apparently near where the moraine formerly dammed the valley forming a lake in which the silts were deposited. The silts are composed of about 35% coarse silt and fine sand, the remainder being silt and clay. They are stiff and of low permeability. The till of the moraine is composed of boulders, sand and silt. At least one thin zone of gravel was present.

Some organic muck which had been deposited behind an old mill dam at the site was also present.

Aquifer Characteristics

The rocks of the Catskill Formation are essentially impermeable, ground water movement is entirely along fracture zones and bedding planes. The glacial moraines are composed mostly of till which is relatively impermeable, but also contain sandy or gravel layers which may have fairly high permeability. At least one such zone was found in the test pits.

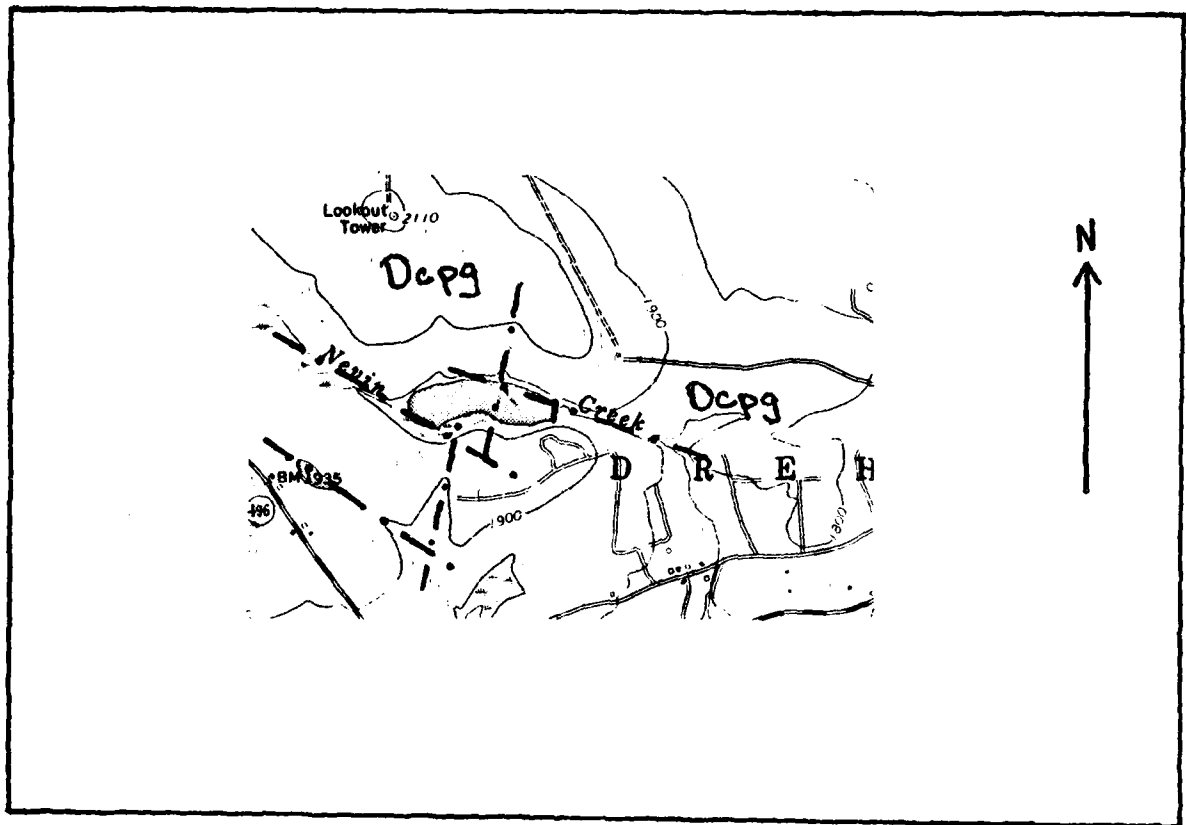
Discussion

All of the recent organic muck was removed from the embankment foundation. The dam has a four foot deep cut-off trench dug into the till and lacustrine silt. Because of the generally low permeability of these materials, no leakage problems are to be expected at this site.

Sources of Information

1. Manuscript Geologic Map of the Newfoundland Quadrangle, in open file, Pa. Geological Survey, Harrisburg, Pa.
2. Geologic report and test pit logs in file.
3. Air photographs, scale 1:40,000. Dated 1973.

GEOLOGIC MAP - TOPOLAR GAP 451 Dam



Dcpg

Catskill fm. - Topolar Gap member

--- air photo fracture trace

